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Here is the Floating Roof YOU helped to build!

the Horton DOUBLE-DECK FLOATING ROO

The desirable features oil men wanted in floating roofs set the standards for the design of the improved Horton *Double-Deck* Floating Roof. An evaporation-prevention device as efficient as *this* floating roof could not be built without the help of men with practical operating experience.

The Horton *Double-Deck* Floating Roof is designed to reduce evaporation loss and to eliminate fire hazard from volatile products stored in flat-bottom tanks. It accomplishes this function, on new or existing tanks, with greater efficiency, lower maintenance costs, fewer operating difficulties and longer life than heretofore believed possible. Some of the construction features which make this roof so efficient are:

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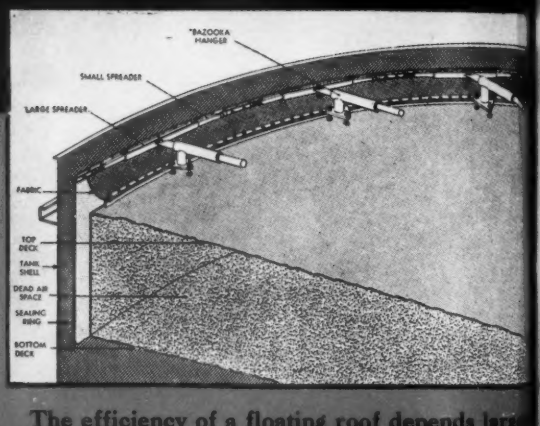
- Smooth top deck surface, free of obstructions, eliminates the collection of dirt and water pockets.



The efficiency of a floating roof depends larg upon the effectiveness of the seal between the r of the roof and the tank shell. The diagramma view above shows the seal on a Horton Doubl Deck Floating Roof tank with a butt welded she It consists of a sealing ring with vertical flexur at two-foot intervals. The top of the sealing ri is joined to the deck by a continuous curtain gas-tight weather-proof fabric. Self-contained "ba zocka" hangers mounted on the top of the ro deck support the sealing ring and apply an ou ward radial pressure at each flexure. This pr sure, combined with the circumferential forces e erted by the flexures themselves, makes the seali ring hug the tank shell tightly at all times.

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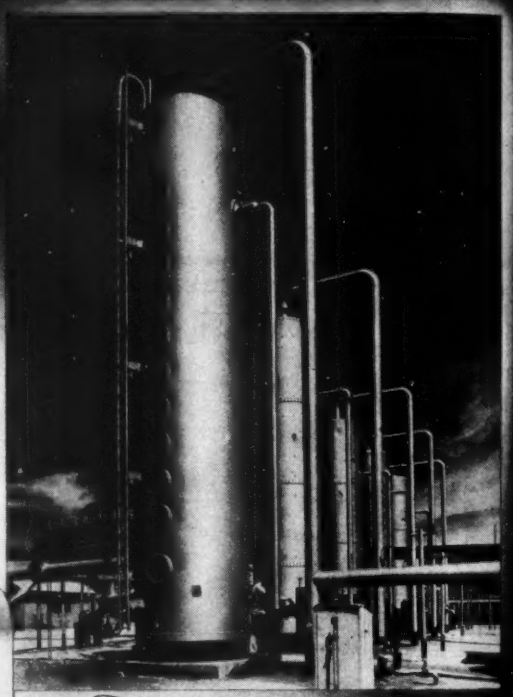

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A Significant Action

THE action taken by the Texas Mid-Continent Oil and Gas Association last week at its annual meeting, seeking clarification of and amendments to the Natural Gas Act, is significant because it revealed that operators now realize that the powers being arrogated by the Federal Power Commission, under the act, are inimical to producers and consumers of both gas and oil. In the past, producers as a group have been inclined to assume that the expansion of FPC powers, supported by court decisions, was something of concern only to the operators of interstate gas systems.

In recent months many operators have come to realize that the unwarranted extension of the commission's authority has to do with today's contractual arrangements and the outlook for their business next year and later. Specifically, producers of gas are confronted with the problem of whether to sell gas moving to interstate markets and as a consequence to have part or all of their operations subject to federal regulations.

When the Natural Gas Act became effective it was thought that the application was clearly limited to the interstate movement of gas. But the act, as enforced by the commission, has extended controls to both distribution and supply. The end uses of gas in relation to other fuels and possible economic and social effects have been considered by FPC in its decisions regarding the construction of new lines and the expansion of existing systems.

At the source end of the interstate systems the commission has exercised the right to determine the price paid by the producer for the gas on a basis of 6½ per cent return on the depreciated original cost of producing properties, including gathering facilities. Thus, the producer may become a part of an interstate regulation although his only contribution is to produce the gas. This matter of net return on production and transportation could be carried out to the point that a producer would receive nothing for his gas.

Furthermore, if this federal commission has authority to regulate the production of gas it is only one step further to include the crude oil produced with the gas, thus making crude-oil production subject to powers which the framers of the Natural Gas Act intended only for the one product.

Natural-gas producers, transporters, and distributors, subject to state regulations, will assume full responsibility for supply and demand at reasonable and competitive prices. Right now operators and the state conservation bodies are bending every effort to reduce gas wastage. What can be done is largely a matter of price received for the gas at the well head and the natural-gasoline plants, and no extension of interstate authority should be permitted to interfere with the plans under way. The right to bargain with all classes of consumers is equally fundamental. Concerted action on the part of the natural-gas industry and its customers is necessary to amend the act to incorporate these features so that neither the commission nor the courts will be in doubt as to where regulation starts and ends.

Texas November Allowable Set At 2,108,166 Bbl. Daily

by Dahl M. Duff

THE Texas Railroad Commission Tuesday issued its November allowable order, setting output in the nation's major producing state at 2,108,166 bbl. daily.

The November net allowable was set at 2,242,730 bbl. daily, which is reduced by an estimated 6 per cent under production to 2,108,166 bbl. daily. The October allowable called for 2,201,634 bbl. daily which, less underproduction was estimated to yield 2,064,855 bbl. daily. Texas production for the week ended October 19 was reported at 2,046,550 bbl. daily. The October 19 net allowable was 2,175,855 bbl. daily.

The commission's order placed the state on a 25-producing day schedule except 21 in East Texas and 20 in West Texas. Texas has been on a 24-day pattern in October. The estimated daily production under the November order is 18,166 bbl. daily above the Bureau of Mines demand forecast of 2,090,000 bbl. daily, and does not include an expected 180,370 bbl. daily of natural gasolines and distillates.

In announcing the November order, Olin Culberson, commission chairman, said the allowables incorporated the new maximum efficiency rates of production as determined in a series of hearings throughout the state during the summer.

Fields where nominations exceeded MER were cut back to the MER figure. In others, allowable was determined as an equitable proportion based on the ratio of the October 19 allowable to the new MER, Culberson said.

The commission chairman said the statewide hearing to fix December allowables will be held November 14 in the House of Representatives in Austin.

At the demand hearing late last week, refining company representatives pleaded with the commission for increased November output to meet crude shortages. H. J. Port, president of the Texas Producers and Royalty Owners Association, asked the commission to delay issuing the order until it is determined whether the threatened Gulf Coast tanker strike is carried out.

However, Paul McDermott, Fort Worth, representing Sinclair Prairie Oil Co., said the strike would have to continue some time to affect the company's purchases. Crown Central Petroleum Co. and American Liberty Oil Co. officials said they could store 750,000 and 1,000,000 bbl. respectively. McDermott said oil could be diverted from tanker transportation to pipe line if necessary, and that commission could handle the situation by an emergency order.

In case the strike was not called, Porter asked that the November allowable be set at a figure not to exceed the Bureau of Mines estimate of 2,090,000 bbl. daily — 3,000 bbl. daily under its October recommendations. Contrasted to this, Texas allowables last week were 2,175,854 bbl. daily. Purchaser nominations for Texas crude in November total 2,435,958 bbl. daily—2,476 bbl. over October.

Both independent and major company refiners disagreed with Porter's request for reduced November production. Companies asking more crude for the remainder of October as well as for November included The Texas Co., Cities Service Oil Co., Sun Oil Co., Republic Oil & Refining Co., and Eastern States Petroleum Co. In support of the request for greater production, J. S. Leach, Houston, representing The Texas Co., said Bureau of Mines statistics revealed demand exceeded forecasts in the second and third quarters by 100,000 bbl. daily.

Disposal of Big-Inch Lines Now Up to New WAA Board

WASHINGTON.—Disposition of the Government's two big-inch pipe lines has now been laid in the lap of a new real property disposal board just formed by War Assets Administrator Robert M. Littlejohn, and the abortive interdepartmental advisory council has been abandoned.

The council blew up last week at its second scheduled meeting when one representative after another announced that his agency would have no part of the responsibility for sale of the big-inch lines. Interior Department withdrew its delegates completely; Army and Navy representatives criticized the procedure, and the Federal Power and Interstate Commerce commissions announced that as regulatory agencies they would provide information if requested but would not give advice on disposition.

WAA officials deny that they have already decided to award the lines to Big Inch Oil, Inc., for petroleum use, though members of the advisory council definitely got the impression that such a decision had been reached and that their function was not to give advice but to endorse a predetermined conclusion.

The new plan is for the WAA utilities branch to make its recommendations directly to the real-property disposal board, probably within a couple of weeks.

This board has been set up as a permanent adjunct to WAA to act on all sales of $1,000,000 or more. It is composed of seven fulltime men, drawn from industry and other government agencies, only one of whom has had previous connection with WAA. It replaces an old review board made up of WAA operating officials delegated to this parttime activity.

WAA officials insist that Congress, through inaction, has approved its January report setting a policy of disposing of the big-inch lines for use of petroleum rather than for gas, and that this is the policy it intends to follow. However, it would appear that the new disposal board has sufficient authority to reexamine the old policy and set a new one. In view of the controversy that has surrounded disposal of the big-inch lines, it is not expected that there will be final action in the immediate future, and it is not unlikely that the matter will again go to Congress for specific approval.

Offshore Leases Held Not Subject to Local Tax

AUSTIN, Tex.—Oil companies need not pay county nor other local ad valorem taxes on offshore leases, according to an interpretation by Texas Attorney General Grover Sellers. The opinion was given in response to an inquiry from State Comptroller George H. Sheppard.

The question arose in connection with an oil-company lease of state land in the Gulf of Mexico from the state. The opinion said, "It is apparent, then, that the submerged lands between the shores of the Gulf of Mexico and the 3-league limit are territory of the state but are not included in the limits of any county."

Left photo: George A. Hill, Jr. (right), president, Houston Oil Co. of Texas, received a plaque awarded to the outstanding independent operator, at last week's meeting of the Texas Mid-Continent Oil and Gas Association. William R. Boyd, Jr., New York, president of the American Petroleum Institute, made the presentation. Right photo: T. E. Swigart (right), president, Shell Pipe Line Corp., was awarded the plaque as the outstanding company executive. Presentation was made by Maston Nixon, Corpus Christi. The selection of Swigart and Hill was made by mail ballot

Taxes, FPC, and Oil-Shortage Theories Are Attacked at Texas Meeting

by E. H. Short, Jr.

HOUSTON.—In a resolution unanimously adopted the Texas Mid-Continent Oil and Gas Association last week went on record that Congress should enact legislation clearly limiting the jurisdiction of the Federal Power Commission. Presented by a committee headed by Curtis Condra, of Fort Worth, the resolution charged that "the commission is exercising control over the use of gas, which is clearly beyond any regulation intended by Congress . . ."

The 2-day Victory meeting of the association celebrating the end of the war, was the first meeting since the 1943 Fort Worth session. Nearly 600 oil men from all parts of the nation participated in a review of the part petroleum played in the winning of the war and then launched into plans for the future.

James Forrestal, secretary of the Navy, was scheduled to appear before the group of oil men Friday but was obliged to cancel his appearance. W. John Kenney, assistant secretary of the Navy, presented his address on "Oil and Victory."

F. W. Shield, San Antonio, president of the Texas Mid-Continent Oil and Gas Association, who opened the Thursday session declared the meeting to be one of the most important held during the 27-year history of the association, since it symbolized the successful completion of the oil men's service as civilians fighting the battle of oil and gas production with worn-out equipment.

Concerning the future of the Texas petroleum industry, Shield called attention to the heavy tax load now being carried by the industry and stated, "Texas needs no more taxes." "Many citizens," said Shield, "do not realize that the oil industry is now paying over 52 per cent of all the state's business and property taxes.

"Last year, for instance, the Texas petroleum industry's share of such taxes amounted to over $62,000,000, against slightly less than $57,000,000 from all other sources combined. Moreover, these vast sums do not include the gasoline taxes paid by Texas motorists, although they are a considerable burden on the sale of our principal product. Last year alone our Texas petroleum industry's tax bill (local, state, and federal levies) totaled over $160,000,000."

An opening blast was directed at FPC by Clint C. Small in a talk on "Price-Fixing by Governmental Agencies." Small said "every producer of oil or gas, as well as every royalty owner is fully justified in being alarmed at the most recent success of the commission in its well-planned campaign to gain regulatory control of natural gas from the time gas leaves the producing formation until it is consumed at the burner tip."

"This attack," Small continued, "upon what is left of free enterprise is only a part of the battle that has been waged continuously by federal bureaucrats for more than a decade. The ultimate objective is the complete subjugation of the petroleum industry. Once control of natural gas is obtained, it will then be a simple maneuver to, as they have earnestly striven to do, take over complete regulation of production, transportation, and refining of crude oil.

"In the Natural Gas Act, Congress attempted to reserve to the producer control over production and gathering of natural gas, but like many of the powers reserved to the states in our national Constitution, the language used in the reservation has either had a literal or a liberal construction, whichever is best suited to the whims of those who strive to nullify these provisions.

"At any rate, we are now confronted with the fact that this reservation in the Natural Gas Act is meaningless—that the plain language used by the authors of the Natural Gas Act has no significance."

Paul W. Pitzer, Breckenridge,

chairman of the theft-prevention committee said last year was a most successful one in theft prevention. He repeated the warning of Homer Garrison, Texas public safety director, that, "big-time gangsters, well-organized in the East and Midwest are attempting to expand their operations into Texas."

Russell B. Brown, Washington, general counsel, Independent Petroleum Association of America, in discussing the necessity for a national oil policy warned that the oil industry should be on the alert against the formation of any bilateral agreement which would give foreign nationals control of the domestic oil industry. As to the oft-repeated prediction that we are running out of oil, Brown said: "This country is not 'running out of oil.' Instead of running out of oil, we are running into confused thinking by those outside who do not understand our problems."

George Hill Honored

Highest honors were conferred upon George A. Hill, Jr., president, Houston Oil Co. of Texas, and T. E. Swigart, president, Shell Pipe Line Corp. Plaques presented by the Texas Mid-Continent Oil and Gas Association signalized the service of outstanding leaders of the petroleum industry during the past year. Maston Nixon, former president of the association, made the presentation to Swigart as the outstanding leader in the company field during the past year. W. R. Boyd, Jr., New York, president of the American Petroleum Institute, presented the plaque to Hill, as the outstanding independent operator.

Resolutions offered by the resolutions committee, headed by Curtis Condra, Fort Worth, paid tribute to officials of the association who have died since the last directors' meeting in Fort Worth in November 1945.

Those so memorialized were the late J. C. Hunter of Abilene, president of the general Mid-Continent Oil and Gas Association; George C. Gibbons, of Dallas, executive vice president of the Texas Mid-Continent; William Pullman, office and membership secretary of the Texas oranization; E. L. Smith, Sr., former president of the Texas body; Mel B. Davis, of Pampa, former vice president for the Panhandle of the Texas association and long a director and member of the executive committee; and A. J. Cunningham, of Houston, president of the Standard Oil Co. of Texas and a director and executive committee member of the Texas organization.

During a brief business session all officers, including directors, of the Texas association were nominated for reelection by a nominating committee headed by W. A. Moncrief, Fort Worth.

The following group of young oil men, many of whom are sons of men active in the Texas oil business, were added to the board: W. E. Flenniken, Houston; Tom Reed, Beaumont; John P. Morgan, Dallas; Clyde Broussard, Beaumont; W. D. Lane, Midland; R. L. Wheelock, Jr., Corsicana; Lester Clark, Breckenridge; W. A. Landreth, Fort Worth; E. L. Smith, Jr., Dallas; W. A. Moncrief, Jr., Fort Worth; Joe Russell, Jr., Houston; John Blaffer, Houston; L. G. Neely, Fort Worth; Edwin B. Cox, Jr., Dallas; Boyd Street, Graham; Arthur Seeligson, Jr., San Antonio; Waldo Wilson, Beaumont; Grady Vaughn, Jr., Dallas; Bill Pitzer, Breckenridge; George Dimmock, Wichita Falls; Billy Davis, Pampa; Tom Slick, San Antonio; Bernard Hilburn, Dallas; and Davis Collett, Houston.

At the Friday morning session, Kenney delivering Secretary Forrestal's address, began his talk with a tribute to the members of the Texas association for a job well done in supplying the vast quantities of petroleum products during the war.

Discussing the movement of supplies during the war, Kenney said that the movement of petroleum products was one of the most difficult. He described the laying of 20 pipe lines under the English channel, some of which were laid a few hours after the Normandy invasion. Reviewing the distribution in the Pacific area, Kenney said that tankships were used for transporting oil and that this required a precision schedule to insure that there be no lapses in attack upon the enemy.

I.P.A.A. to Meet in Fort Worth

THE petroleum supply-and-demand picture, government oil-import proposals, and a national oil policy are among the topics slated for major attention at the seventeenth annual membership meeting of the Independent Petroleum Association of America October 28-30 at the Blackstone Hotel in Fort Worth.

Highlights of the 3-day meeting, which will attract independent operators from all the nation's producing areas, include talks on oil imports by three government officials—Charles B. Rayner, state department adviser on petroleum policy; Col. G. H. Vogel, executive officer of the Army-Navy Petroleum Board; and Capt. R. E. Wilson, U. S. N., deputy executive officer. Rayner and Colonel Vogel's predictions of large oil imports in coming years on a recent radio program resulted in widespread criticism from the oil industry.

B. A. Hardey, Shreveport, I.P.A.A. president, will deliver his annual address at the general session Monday afternoon, October 28. Meetings of the association's various standing and special committees make up that part of the program not devoted to formal discussion. Association officers for the 1946-47 year will be elected at the concluding session.

Several committee meetings are scheduled Sunday, October 27, in advance of the opening of the main meeting. Registration will open at 8 a.m., Monday, October 28. Another oil-industry organization, the National Stripper Well Association, is scheduled to hold a meeting concurrently with the I.P.A.A.

A condensed program follows:

MONDAY, OCTOBER 28

Committee meetings, 9:30 a.m.—The following special and standing committees will meet: on balance of supply with demand; budget and finance; credentials, rules, and order of business; on the Federal Power Commission hearings; drilling contractors; Interstate Oil Compact Commission; nominating; membership; national oil policy; oil and gas production; resolutions; secondary recovery; constitution and bylaws; on stripper-well problems; tax policy; and public lands.

Business meeting of National Stripper Well Association, 9:30 a.m.

Luncheon meeting, 12:15 p.m.—H. M. McClure, N.W.S.A. president, presiding. Address, Beauford Jester, member, Texas Railroad Commission.

General session, 2:30 p.m.—W. L. Stewart, Fort Worth, presiding. Annual address, B. A. Hardey, I.P.A.A. president; report of the general counsel, Russell B. Brown, Washington; report of the special committee on stripper-well problems, J. Paul Jones, chairman.

TUESDAY, OCTOBER 29

General session, 9:30 a.m.—George H. Bruce, Wichita, Kans., presiding. Report of committee on balance of supply with demand, Charles F. Roeser, chairman; talk, Charles B. Rayner, State Department adviser on petroleum policy; talk by Col. G. H. Vogel, executive officer of the Army-Navy Petroleum Board; talk by Capt. R. E. Wilson, U.S.N., deputy executive officer, A-NPB; "Congressional Policy on Oil Taxes of Great Public Benefit," Lovell Parker, Washington attorney; "Effect of War on Our Domestic Reserves," James V. Brown, I.P.A.A., Washington.

Luncheon dedicated to younger men in the industry, 12:15 p.m.—Grady Vaughn, Jr., Dallas, presiding. Address, Dr. Joe J. Mickle, Centenary College, Shreveport, La.

General session, 2:30 p.m.—Eugene Jordan, Oklahoma City, presiding. Report of national oil policy committee, Ralph T. Zook chairman; panel discussion of papers presented at the morning session, featuring discussion of national oil policy.

Annual banquet, 6:45 p.m.—B. A. Hardey, I.P.A.A. presiding, speaker to be announced.

WEDNESDAY, OCTOBER 30

General session, 9:30 a.m.—Clarence Smith, Flora, Ill., presiding. Committee reports; "Value of Gas in Relation to Conservation and Also to Its Intrinsic Value," Dr. Frank H. Dotterweich, Texas College of Arts and Industries, Kingsville.

Luncheon meeting, 12:15 p.m.—Jake L. Hamon, Dallas, presiding. Address, Maston Nixon, Corpus Christi; discussion of problems facing independents.

General session, 2:30 p.m.—Frank Buttram, Oklahoma City, presiding. "Effective Cooperation of Associations of Oil and Gas Producers," H. B. Fell, Ardmore, Okla. Meeting of board of directors for election of new officers.

THIS 1946 WEEK

S M T W T F S

INTERNATIONAL—U.N. reported preparing to name W. B. Uderski, former UNRRA fuels division chief, as fulltime petroleum adviser. . . . Speculation rife on possible moves for international oil control with indications that plans thus far advanced will meet intense opposition from the American oil industry. . . . ¶UNRRA contracts for 787,000 bbl. of crude from Arabian American Oil Co. to be delivered during the next 2 months to Italy at a price of $1.13 per barrel, f.o.b. Ras Tanura. . . . ¶New Zealand Government, Anglo-Iranian Oil organize joint marketing company with New Zealand Government holding 51 per cent of stock. . . .

PRODUCTION—U. S. output in week ended October 19 curves downward 20,978 bbl. to 4,735,632 bbl. daily. . . . ¶Refiners report extremely tight crude supply. . . . Requests for more production heard again at Texas Railroad Commission meeting but producers question if demand is refining or consumptive. . . . ¶Kansas Oil and Gas Association group, Atlantic Refining file suit to force modification of Kansas Corporation Commission's 15-bbl. minimum well allowable order. . . .

ACQUISITIONS—Leland Fikes, Dallas independent, buys Maguire Industries properties, including 74 Texas and Kansas producing wells, for a reported $2,000,000 in cash and production. . . . ¶Stanolind Oil & Gas closes purchase of Ramsey Petroleum stock for some $3,250,000. . . . ¶Sohio Petroleum Co. acquires all assets of Sharon Drilling. . . . ¶Toronto Pipe Line, British-American subsidiary, buys Clay County, Texas, gathering system from Bell Oil & Gas Co. . . .

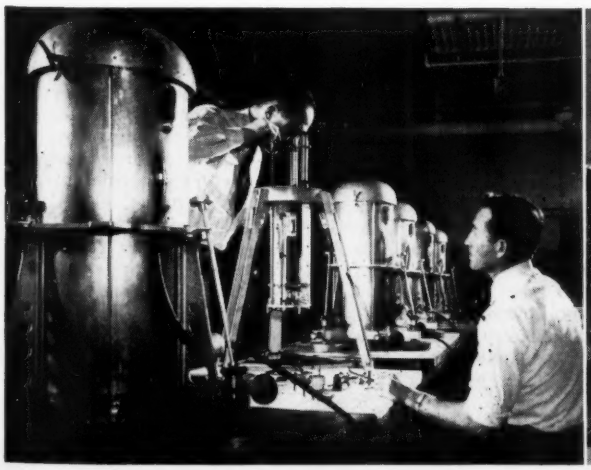
TRANSPORTATION—Government officials cancel UNRRA-requested order for 183 miles of steel pipe for Russia from A. O. Smith Corp. . . . U. S. officials deny order carried priority, but Gov. Earl Warren of California protested it would interfere with construction of Texas-Los Angeles gas line. . . . ¶Phillips makes public plans of Standish Pipe Line to lay a 289-mile 12-in. crude line from West Texas to Phillips' Borger refinery. . . . Company says consideration of 10-in. line from Borger to Yale, Okla., has been deferred. . . . ¶Supreme Court hears briefs in Champlin Refining case on whether private carrier moving petroleum interstate by pipe line for its own use is subject to ICC regulations. . . .

REFINING—M. H. Robineau, Frontier Refining president, tells stockholders company is negotiating to buy "at favorable price" U. S. aviation-gasoline plant at Cheyenne, Wyo., which Frontier operated during the war. . . . ¶Shell announces new $1,500,000 plant at its Shelburn, B. C., refinery, will be operating in November. . . . ¶Cooperative Refinery officials say organization considering construction of 3,500-bbl. Grand Junction, Colo., refinery with pipe line from Rangely field. . . .

NATURAL GAS—More briefs filed in windup of FPC's natural-gas investigation. . . . Positions of state regulatory bodies vary widely from antiexport stand of Louisiana to state-rights plea of Texas. . . . ¶Texas Mid-Continent Oil and Gas Association goes on record for legislation clearly limiting FPC powers. . . . Oil-industry alarm grows over widening scope of commission's jurisdiction particularly toward invading production activities. . . .

LABOR—Jersey Standard and affiliates, including Humble and Carter, give employes cost of living bonus in form of week's pay or outright cash allowance. . . . ¶O. A. Knight, O.W.I.U., says guaranteed annual wage, workers health and welfare funds, among aims of union. . . . O.W.I.U. leaders open important wage-price policy meeting in Galveston. . . .

Accurate measurement of minute quantities is a keystone operation in nearly all branches of science. These photographs bear testimony to its importance to the petroleum industry. Right, gravimeters under construction in Gulf Oil Corp.'s research laboratories so sensitive they record gravitational "tides" created by the attraction of the moon and sun and distinguish gravity variations in the earth of less than 1/100,000 per cent. Gulf's micro laboratory is shown in the left photo. Here, fuels are analyzed in quantities of 1/10,000 to 3/100,000 ounce. The battery of equipment shown is for the rapid, automatic determination of carbon, hydrogen, and nitrogen in organic compounds



Diverse Recommendations Made By States in Briefs With FPC

by Henry D. Ralph

WASHINGTON.—A marked diversity of opinion among state regulatory bodies as to the proper scope of natural-gas regulation is evident in briefs and summary statements filed last week with the Federal Power Commission as part of its lengthy natural-gas investigation.

At one extreme are the states of New York and Louisiana, which take roughly parallel positions that the federal Natural-Gas Act should be amended to give FPC more authority, particularly to regulate the end use of gas moved through interstate transmission lines.

At the other extreme are the states of Texas, Montana, and Oklahoma which insist that the state government have ample power to do all necessary regulating and that no extension of federal jurisdiction is desirable, though Texas wants the law amended to make sure FPC does not undertake to regulate production.

In between is Kansas which, while agreeing with Texas that FPC should keep entirely out of production and gathering, leans somewhat toward Louisiana's position that local gas reserves are being exploited by the coal-rich industrial East in wasteful uses and at ruinously low prices.

One fact stands out in all the briefs which have been filed by gas companies, coal and railroad interests, and the state commissions—all parties agree that FPC should not encroach on state jurisdiction over production and gathering, should not attempt to give producers, local gathering systems, or natural-gasoline plants a public-utility status just because their gas reaches an interstate trunk line, and should not fix low prices for gas in the field through application of public-utility rate-base formulas.

Coal and Railroad Briefs

The brief for coal and railroad interests does suggest that FPC require transmission companies to purchase gas produced in solution with oil where this is economically feasible and where it would otherwise be vented into the air or flared, but it opposes any other type of federal incursion into the area of production. In fact, these interests vigorously insist that FPC require transmission companies to price their gas on the basis of arm's-length bargaining with producers, citing the incidental reason that high gas prices promote conservation and admitting the main reason that the higher the price of natural gas the less competition with coal.

Much is said about conservation in many of the briefs, but virtually all the discussion is about conservation in use rather than in production practices. The general feeling seems to be that prevention of waste in gas production is entirely a matter for state control, and so is the local field price of gas.

The statement filed by the attorney general of Louisiana is essentially a plea for the retention of the state's gas at home for the development of industry and other resources on the spot. It stresses these points:

FPC now has authority to consider matters of conservation and the end uses proposed to be made of gas in certificate applications, and should, in the broad public interest, consistently invoke and exercise such authority.

State authority standing alone is powerless to protect properly and completely and to conserve its natural-gas resources without the aid and assistance of FPC where interstate commerce is involved.

Indiscriminate granting of certificates for construction of new interstate lines will jeopardize both the reserves and markets of the competing pipe lines.

Federal regulation of scarce resources is an accepted public policy and is not contravention of free enterprise.

FPC should, if necessary by additional legislation, prohibit transmission to an area already having ample fuel or from an area in danger of having its reserves depleted; take jurisdiction over industrial sales to promote conservation and prevent discrimination in rates and service; and prevent the transportation and sale of dump gas for inferior purposes to create a high load factor.

On this last point, it is interesting that the New York and Kansas commissions, as well as the coal interests, contend that long-distance transmission lines should be so engineered that they do not need to depend on sale of dump gas on low-rate interruptible contracts during off-peak seasons in order to operate economically.

The New York Public Service Commission gives its considered opinion that in the natural-gas industry conservation cannot be accomplished by each state acting independently (speaking again of conservation in use rather than in production), and cites its own example of early exhaustion of Oriskany gas through "low-grade" uses.

The New York commission does not want the federal Government encroaching on what it considers its proper field of regulation, so it proposes that (1) FPC handle all phases of the public interest in interstate transmission and sale, including the end use of gas to be transmitted; (2) companies engaged in interstate transmission should be under FPC control and should be limited to sales to other transmission companies and to local distributing companies; and (3) sales to ultimate consumers, including sales for industrial use, should be made only by local distributing companies, and sales of interstate gas between local distributing companies within a state should be wholly under the jurisdiction of that state.

Texas Governor's Statement

The Texas governor's committee submitted a rather voluminous statement, the chief burden of which is that FPC should not attempt to regulate the field price of gas nor the activities of gas producers, gatherers, or compressors.

Several coal interests have also filed statements with the commission, the most extensive one being submitted jointly by National Coal Association, United Mine Workers of America, Railway Labor Executives Association, Brotherhood of Locomotive Engineers, and American Retail Coal Association. This brief deals particularly with competition among fuels, unemployment caused by displacement of coal by gas, and promotion of conservation by prohibiting "wasteful" uses of gas. It makes an extended plea for FPC regulation of the end use of natural gas moved in interstate commerce, contending that reserves will be soon exhausted unless use is confined to such superior purposes as domestic cooking and water heating.

This group contends that space heating is a wasteful use of gas in regions where other fuels are available, even in homes, now that the coal industry has developed such efficient and handy automatic stokers, and is a particularly pernicious practice when gas is priced just enough under coal to woo customers away from solid fuel. It also insists that there is virtually no industrial process for which natural gas is really essential and that gas should not be used by industry outside the states where gas is abundant and coal is scarce.

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Gasoline 63 Cents a Gallon Under New French Duty

NEW YORK.—Although it is generally believed that the recent import duty increases on gasoline and gas oil into France were imposed exclusively as a revenue-raising measure and that its life will be of relatively short duration, foreign oil circles here point out that the move is difficult to understand in view of the French Government's assurances last November that such a move would not be taken. Moreover, the timing is also peculiar, interested sources add, as a world trade congress is now in session in London — a congress which aims at reducing trade barriers.

However, in view of the relatively small production of gasoline and gas oil from local French refineries in relation to needs, indications are that the import hikes were not imposed as any form of a protective tariff.

The import duties on gasoline were increased from 4 to 12 francs a liter and on gas oil from 120 francs to 695 francs per 100 kg. (about 0.79 bbl.). Thus, the official sales price for gasoline in U. S. currency is 63 cents a gallon compared with a previous 36 cents a gallon. Gas oil is now being sold at about 40 cents per gallon. The French franc is equal, at official rates, to 120 for a dollar.

While the import duty hikes might well be protested on the basis of an agreement signed by U. S. and British officials last November 8, indications are that it will not be, at least for the present. One of the uppermost questions in the minds of U. S. and British oil men interested in the French oil picture is whether French authorities consider gasoline to be an economic need or a luxury. Whatever the view, current prices make it almost prohibitive.

In 1938, approximately 2,711,000 bbl. of gasoline were imported into France from the United States, and 336,000 bbl. of gas oil. Total imports (which include those from the United States) for the same year were 4,641,000 bbl. of gasoline and 688,000 bbl. of gas oil.

In 1945, a total of 5,370,000 bbl. of gasoline were imported from the United States and other countries, and 2,325,000 bbl. of gas oil. The jump in gas oil imports in 1945 as compared with 1938, is said to have resulted from a shortage of coal as well as from number of fuel oil conversions.

New Zealand, Anglo-Iranian Organizing Joint Company

LONDON. — With the anticipated consent of the New Zealand Government, officials have announced a plan whereby New Zealand will become 51 per cent owner of a joint company with Anglo-Iranian Oil Co., Ltd., which is about 56 per cent owned by the British Government.

Refinery Reconstruction Begun in N.E.I. Area

SINGAPORE. — With full knowledge and approval of British military authorities and the Dutch Government, Royal-Dutch Shell and Nederlandsche Koloniale Petroleum Maatschappij officials have begun actual reconstruction work on war-damaged refineries at Pladjoe and Soengei Gerong, both in the Palembang district of Sumatra. N.K.P.M. is jointly owned by Standard Oil Co. (N. J.) and Socony-Vacuum Oil Co., Inc.

Moreover, NKPM and Shell are reported to have reached a working agreement with Indonesian labor with regard to wages and other working conditions.

Recently, representatives of N. V. Nederlandsche Pacific Petroleum Maatschappij, Standard Oil Co. of California and The Texas Co. subsidiary, were granted safe conduct by Indonesian republic and officials to visit the company's holdings in the Minas field.

It was learned that the Wonokromo refinery, on Java, is in partial operation again. Before the war, this was a 2,500-bbl. daily skimming plant. It is owned by N. V. de Bataafsche Petroleum Maatschappij (Shell).

Russia's Iranian Grant Facing Invalidation

NEW YORK.—The possibility that the oil concession Russia obtained several months ago from Iran will be voided arose early this week when the Iranian consulate said it is unlikely the country's Parliament can be chosen and convened in time to ratify the pact before the October 24 deadline.

A recent London dispatch said a Soviet foreign office official had suggested that, since internal troubles were interfering with the Iranian elections, that representatives of all branches of Iranian life be called together to ratify the concession. The Soviet official recalled that the D'Arcy grant was obtained in this manner. However, Iranian Premier Ghavam replied that the D'Arcy concession was obtained when Iran was without a constitution and under present circumstances a decision on the pending concession cannot be made without the consent of Parliament.

Materials Awaited for 24, 26-in. Venezuelan Pipe Line

NEW YORK. — A combination 24 and 26-in. crude-oil pipe line to extend from Creole Petroleum Corp.'s Ule tank farm at La Salina to Amuay Bay on the Paraguana Peninsula, will be constructed as soon as the necessary materials are available. Williams Brothers Corp. has the contract.

The line will consist of two sections, each with 20 miles of 24-in. line and 56½ miles of 26-in. line, or a total of 153 miles. This will be the largest diameter crude-oil pipe line in the world. Current plans call for two pumping stations, with 12 Cooper-Bessemer gas diesels (1,000 hp.

each at 300 r.p.m. driving Worthington triplex pumps).

In addition, there will be four C-B general units to serve unloading stations at Amuay Bay. The pump stations are to be located at Ule and Babajura.

Capacity ranges from 240,000 to 300,000 bbl. daily, depending on the gravity crude sent through the pipe line.

Third Spring Hill Test Comes in as Gas Well

SANTIAGO.—Chile's third deep test well, in Spring Hill field, Tierra del Fuego Archipelago, came in recently as a gas well. It was drilled through the Spring Hill sand, 34 m. (111 ft.) higher than the discovery well. Because casing was set in top of the sand, the gas-oil ratio will be too high to enable it to be produced as it is now completed.

Number 4, to be located about 400 m. (about ¼ mile) east of No. 3 and probably on the same contour as the discovery well, is slated to be spudded in shortly.

Chile's first well was brought in December 29, 1945, and is believed capable of flowing 8,000 bbl. daily of 39° (A.P.I.) gravity crude. Due to lack of transportation, it is now shut in. The second well, abandoned earlier this year, was a dry hole.

Competent authorities maintain that Spring Hill field will be a prolific producer with 1,000 bbl. daily as the average flow from wells drilled here. Refinery plans have not yet gone into the construction stage, but reports are that completion of a 10,000-bbl.-daily refinery is still envisioned by the end of 1947 or early in 1948. Chile's projected expenditures for development of oil wells, refining facilities, and other necessary construction, approximate $40,000,000.

More Austrian Vehicles Idle With Russians Holding Fuel

WASHINGTON. — Russia's continued curtailment of gasoline and oil supplies has brought a "very serious" increase in the number of idle vehicles in the American occupied zone of Austria, General Mark W. Clark told the War Department in a recent report.

As a result, Clark said, American forces have had to supply 144,000 gal. of gasoline and 115,000 gal. of diesel oil to the civilian population to meet essential needs.

Russian Writers Say Soviet Reserves World's Greatest

Russia has more oil reserves than any other country in the world today, according to P. Ivanov and V. Poznanskaya in a recent article appearing in U.S.S.R. Information Bulletin. In 1937, the article says, Russian reserves were estimated at 6,376,000,000 tons (about 45,000,000,000 bbl.), or 55 per cent of the world's "visible" reserves. Production in 1940 was estimated at 31,000,000 tons (about 217,000,000 bbl.) and is slated to reach 35,400,000 tons, annually during the course of the current 5-year period and will reach the 60,000,000-ton mark by 1965, the article continued.

The steady prospecting for oil in the district between the Volga and Urals has resulted in the discovery of a huge oil deposit in the Tuimazy district of the Bashirian Autonomous Republic. In the Kuibyshev oil fields four times more oil is being produced than before the war, the article says. Prospects for the development of the oil industry in the eastern districts of Russia are tremendous, the two writers state, with over 4,000,000 tons of oil being produced in that region in 1940. Pozmanskaya is a Russian mining engineer; Ivanov was identified as a master of economic sciences.

Plans Revealed for 1,000-Mile Argentine Gas Pipe Line

BUENOS AIRES, Argentina.—President Peron told a special session of the Argentine Congress October 21 that in decentralizing the country's industry, one of the first plans will be construction of a natural-gas pipe line from Comodoro Rivadavia fields to Buenos Aires, a distance of about 1,000 miles.

One objective will be to encourage industry to build plants along the pipe line and take advantage of a cheap fuel supply.

German Reports Released

WASHINGTON. — Demonstrating progress of the Germans in producing synthetic liquid fuels and other synthetic products, the Bureau of Mines last week released for distribution five technical reports dealing principally with wartime fuels and lubricants in Germany. The bureau reports cover a portion of the work of teams investigating coal, oil, gasification, and allied chemical fields.

Italy Will Receive 787,000 Bbl. of Crude From Arabian American Terminal

NEW YORK.—During the next 2 months, 787,000 bbl. of crude will be delivered to Italy from Arabian American Oil Co.'s Ras Tanura terminal. Purchaser is UNRRA and price was reported at $1.13 per barrel, f.o.b. Ras Tanura.

With these purchasers—and presumably additional ones to be made—Italian oil refineries at Naples, Bari, La Spezia, and Porto Maghera will soon go on stream with Middle East crude. (An article on Italy's postwar refining picture was published in the Journal, October 5, page 43).

Reports from Rome state that crude oil for Italian refineries will be imported and paid for by UNRRA for the first 6 months of postwar operations. Moreover, the Allied military authorities are said to have agreed to release sufficient storage tanks at Naples and Bari to permit operations of these refineries. The Naples and Bari refineries are expected to turn out 50 per cent of the gasoline, 10 per cent of the diesel and fuel-oil requirements, and all the paraffin for UNRRA's monthly program in Italy.

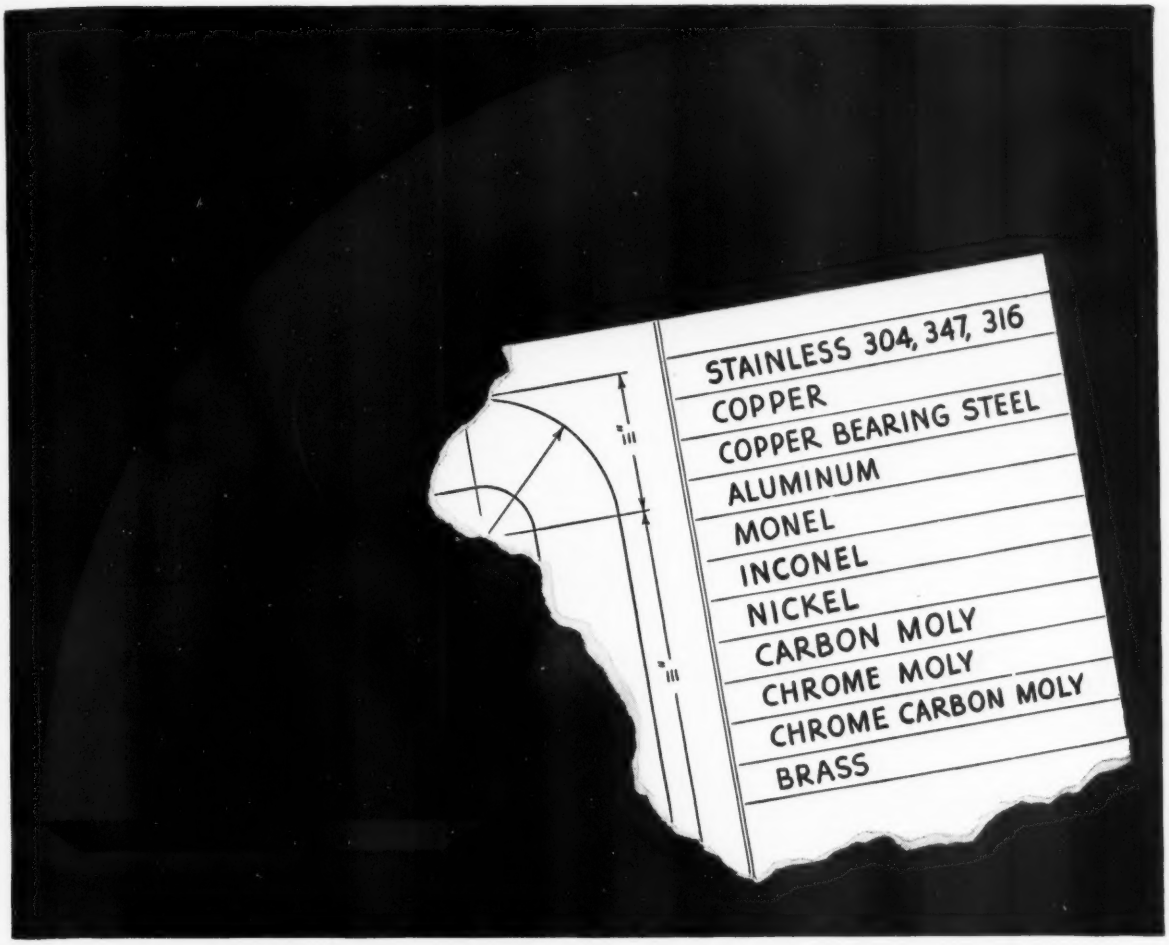
These two refineries are slated to be operated at the full capacity of their existing equipment. Bari's throughput is expected to reach 25,000 tons (175,000 bbl.) per month, and Naples about 20,000 tons (140,000 bbl.).

Present plans vision the La Spezia and Porto Maghera refineries back on stream in from 3 to 4 months.

UNRRA is scheduled to assume responsibility for importing all petroleum products into Italy, in the near future, and presumably will handle the chartering of the necessary tankers. The products refined in Italy will replace an equivalent volume originally planned as imports. In short, the operations of Italy's refineries will obviate the need to import as great a volume of products as UNRRA at first thought necessary. No immediate increase in the estimated demands for products is anticipated.

The Naples refinery (Raffineria de Napoli S.A.I.—Socony-Vacuum) had a daily crude capacity, in 1939, of 5,500 bbl. daily of which 4,000 was cracking. The Bari refinery (Azienda Nazionale Idrogenazione Combustibilii) had a 1939 daily crude capacity of 4,400 bbl. of which 2,000 was cracking. Ten refineries operated in Italy before the war, with an aggregate daily capacity of 58,000 bbl. and 28,600 bbl. cracking capacity.

While UNRRA expires December 31, a $100,000 loan to Italy from the United States is practically completed. Part of this fund presumably will be used for continuing Middle East crude purchases.



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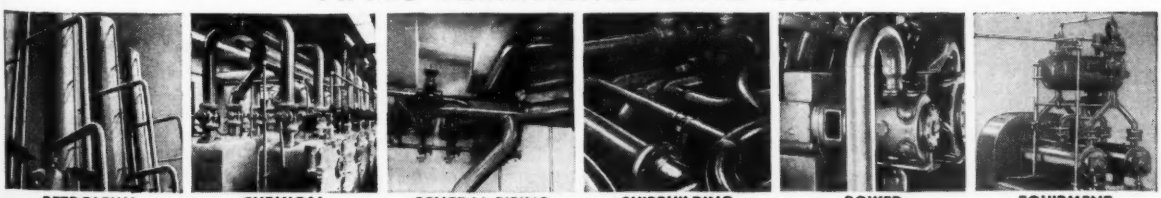

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Enigmatic Russia throws a question mark over all discussion of "global" oil planning. Observers doubt that the Soviets will enter into any scheme for international petroleum control. Here is a general view of Bibi Eibat oil field on filled-up Baku Bay

U. N. Names Petroleum Adviser Amid Speculation Over World Oil-Control Plans

by Warren W. Burns

NEW YORK.—While it would take a crystal ball to determine whether the oil industry in the United States—and in the world for that matter—will ever be placed in the hands of an international authority, indications are that "global thinking" on the petroleum level is being engaged in by more than the U. S. State Department.

The latest indication is an unofficial, but nevertheless authoritative, disclosure that within a few weeks the United Nations will have a full-time petroleum adviser on its payroll. His name: W. B. Uderski, now chief of the fuel division of the United Nations Relief and Rehabilitation Administration. Currently, Uderski is in Washington, but he is spending some time hunting a house in the New York City area.

Exactly what U. N.'s petroleum adviser will do once he becomes a top official with Trygve Lie, secretary general of the United Nations, he himself reportedly doesn't know. But the appointment is significant and certainly indicates that sufficient pressure has been put on the U. N.'s secretary general for that body to look into world oil.

Since discussion started in 1943 on the projected Anglo-American petroleum agreement, more than a little interest—not forgetting heated feeling—has resulted over postwar planning of the world's oil resources. And as is often the case, the ultraliberals

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in political circles have taken the ball and rushed madly up and down between both goal posts. The result: all-around confusion.

In an attempt to blow away some of the fog which surrounds world oil planning, the Journal has interviewed well-informed oil officials on the subject, officials whose views range from opposition to support on proposals that have been advanced.

Believe Treaty Will Be Backed

Certainly not a concensus, but possibly of greatest interest, was the opinion that the State Department will, despite official announcements in the form of "thinking out loud over the air waves," back to the hilt passage of the Anglo-American petroleum treaty when it comes before the Senate foreign-relations committee early next year. Asked if such tactics would not be contrary to the global (multilateral) thinking expressed since the treaty was signed September 24, 1945, one high-ranking oil man said, "not at all." Here is how he figured:

While the proposed treaty is between only two countries, the United States and Great Britain it provides a blueprint whereby all interested producing and consuming countries might be members. Specifically, this plan—Article 3 of the final draft—states:

"With a view to the wider adoption of the principles embodied in this agreement, the signatory governments agree that as soon as practicable they will propose to the governments of all interested producing and consuming countries the negotiation of an international petroleum agreement which would establish a permanent international petroleum council.

"To this end the signatory governments agree to formulate at an early date plans for an international conference to negotiate such a multilateral petroleum agreement. They will consult together and with other interested governments with a view to taking whatever action is necessary to prepare for the proposed conference."

With this article of the proposed treaty in mind, the State Department may figure that, as a means of expediting world oil planning, machinery for the Anglo-American oil body should be powered by the United Nations. In other words, once Congress approves the treaty, there is a possibility that the State Department, and possibly some British officials, may figure that the Anglo-American oil advisers should immediately seek entrance to the United Nations. But how could this be done?

Under the U. N. charter there is

the following provision (Article 57):

"The various special agencies, established by intergovernmental agreement and having wide international responsibilities, as defined in their basic instruments in economic, social, cultural, educational, health, and related fields, shall be brought into relationship with the United Nations in accordance with the provisions of Article 63."

Article 63 reads:

"The Economic and Social Council may enter into agreement with any of the agencies referred to in Article 57, defining the terms on which the agency concerned shall be brought into relationship with the United Nations. Such agreements shall be subject to approval by the General Assembly.

"It may coordinate the activities of the specialized agencies through consultation with and recommendations to such agencies and through recommendations to the General Assembly and to the members of the United Nations."

Also relevant to this discussion is Article 71 of the U. N. charter which provides for private, as opposed to governmental, world organizations. Article 71 reads:

"The Economic and Social Council may make suitable arrangements for consultation with nongovernmental organizations which are concerned with matters within its competence. Such arrangements may be made with international organizations and, where appropriate, with national organizations after consultation with the member of the United Nations concerned."

The fact that U. N. shortly will announce the appointment of a petroleum adviser gives credence to reports that global oil planning is proceeding at high policy levels.

However, in relation to coordinating the international oil body proposed in the Anglo-American petroleum agreement with an international petroleum commission — whether or not under U. N.—as envisioned by certain State Department officials, the approach just outlined may be faulty due to at least two reasons:

1. The proposed Anglo - American treaty is so worded that the intent is plain; it would organize an advisory body only. If it were under U. N., world oil problems would, presumably, receive prompt and effective action by the United Nations.

2. The praticipation of Russia in any such body is generally considered the greatest stumbling block, and it is even doubted if the Soviet could be persuaded to participate in a multilateral advisory body such as is envisioned in the proposed Anglo-American petroleum treaty.

But whether the State Department and other government officials envision the machinery of the Anglo-American treaty as a subsidiary of U. N. or would be prepared to scrap it in favor of the projected international petroleum commission, remains a mystery. A guess is that the State Department wants to engender some world oil thinking. In that it has been successful. Focal point of much of this discussion is John A. Loftus, and to a degree, Charles Rayner, both State Department oil officials.

Loftus, chief of the petroleum division, set off the spark in his July 30 address at the University of Pittsburgh. August 17, Rayner in a radio talk, said in answering questions as to what the duties of a world-wide oil committee or authority under the U. N. might be:

"Its first duty would be to study the international oil trade and to be prepared to advise governments and oil companies on the types of arrangements that are most beneficial to all parties."

May Have Other Functions

But this sounded too much like the projected Anglo - American oil setup. Loftus explained that "such a world oil organization might have functions which were not assigned to the Anglo-American commission. For instance, it might review the terms of oil concessions and contracts and suggest revisions."

And on this, the State Department heard from all sections of the oil industry, including the British, who wanted to know what all this was about.

Another explanation made by Loftus also caused many to wonder. In the same August 17 radio talk, he said that such a world-wide oil body "might serve as sort of an appeal board or arbitral tribunal where nations and oil companies too that feel

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they have been subjected to discrimination could come to seek a hearing and perhaps an adjustment."

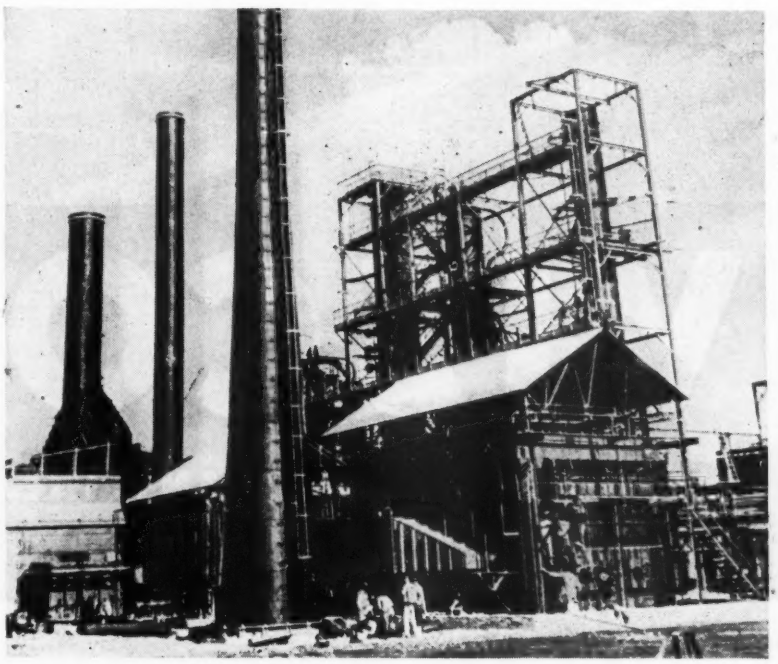
From indications to date, there is only one group which openly backs the Loftus-Rayner visions. That is the International Cooperative Alliance Congress which recently met in Zurich, dusted off the Atlantic Charter and pointed out that Article 4 of this charter inferred that petroleum was one of the materials implied in the trade of raw materials. Moreover, the co-ops state that regardless of who had the foresight and capital to develop the world's oil reserves, the Middle East in particular, these reserves should be thrown open to all.

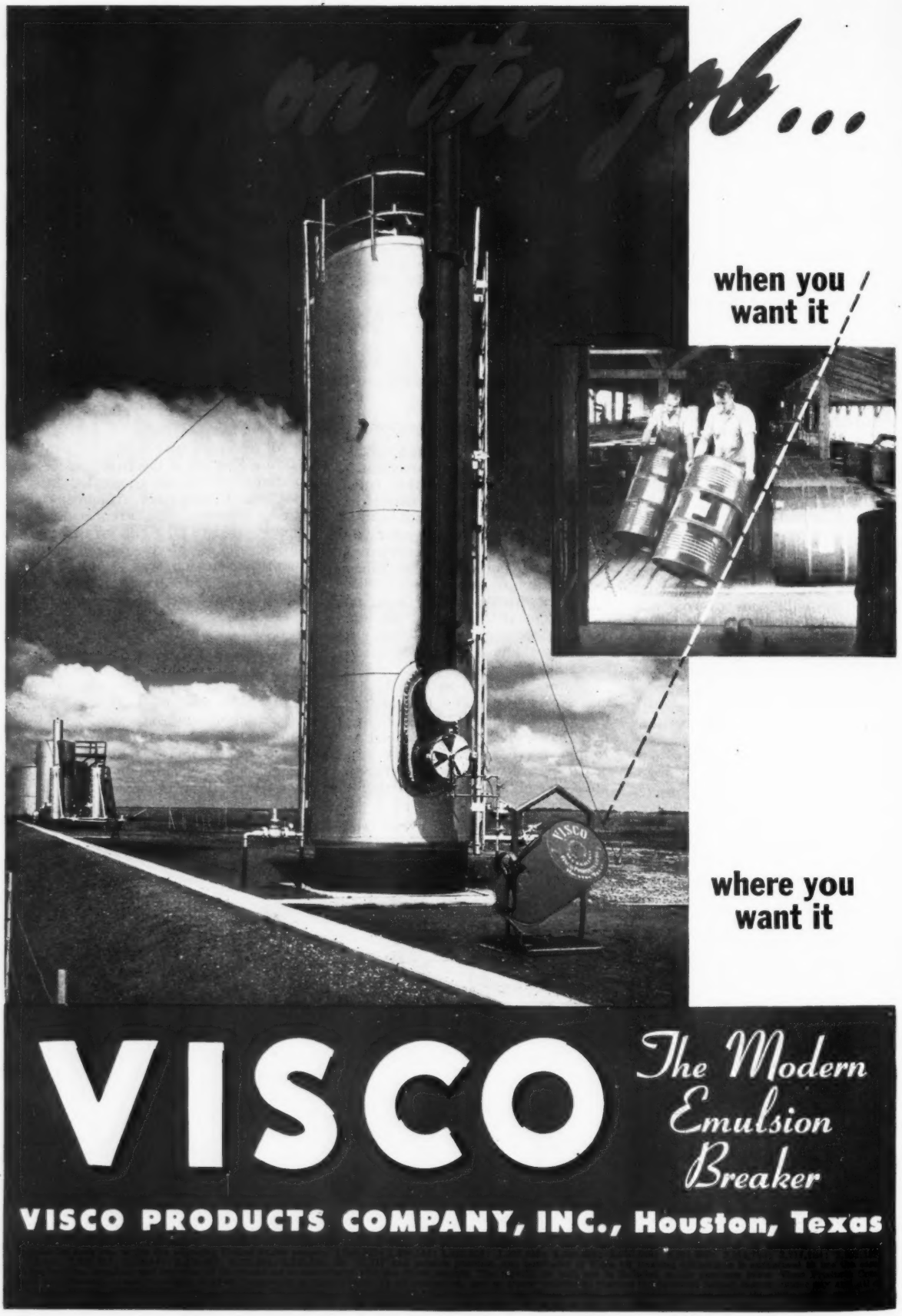
An international body to control Middle East oil is the first step being planned by the newly created International Cooperative Alliance Congress. However, the French delegation refused to go along on this resolution, and as of the middle of this month discussion was stymied until the French and American co-op delegates could reach an agreement.

Japanese Output Gains

WASHINGTON. — Five new oil wells have increased Japan's average weekly oil production to 28,959 bbl. for the 5 weeks ending August 3, Gen. Douglas MacArthur announced last week in his August report to the War Department.

View of a large oil refinery built during the war in Kuibyshev, in Russia

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Progress Reported by N.G.A.A. and N.A.C.E. in Fight on Corrosion

DALLAS.—Meeting concurrently in Dallas October 17, members of the Natural Gas Association of America's corrosion research project committee and the National Association of Corrosion Engineers cleared information on progress of the last quarter's work. Both groups are conducting intensive research on corrosion in high-pressure condensate wells.

T. S. Bacon, Lone Star Gas Co., Dallas, and chairman of the N.G.A.A committee, reported definite progress along all phases of the cooperative study. Of primary interest was a report on a new oil-soluble inhibitor, Kontol 115, which has shown successful results in arresting corrosion in one particular well in West Tuleta field of South Texas.

The two University of Texas fellowships, physical chemistry under Dr. Norman Hackerman and the study of organic acids under Dr. H. L. Lochte, indicated progress along those particular lines of study. Augmented information on efficient characteristics now cover data on the hydrocarbon-liquid phase in addition to the comprehensive compilation on characteristics of the liquid water produced with condensate. Such work is now conducted by D. A. Shock who, as field correlator for the committee, began fulltime study on the subject in July.

Sodium Chromate Tests Reported

Continued field work with sodium chromate was reported by Bureau of Mines engineers, who are also conducting laboratory tests on alloys. The field study of sodium dichromate centering in Erath field, South Louisiana, was featured by a direct examination of tubing and casing strings pulled for that purpose. Both chemicals continue to provide protection, although some difficulty with deposition of salts in tubing and flow lines is being encountered.

Use of a high-pressure gage glass in well-connection lines was reported as a new tool in studying pH values under well-head pressures. Atmospheric pH evaluations fail to indicate actual high-pressure conditions due to the escape of carbon dioxide upon pressure reduction, and the new method promises accurate colormetric determinations under producing conditions encountered at the well head. Refinements in the gage glass call for use of a nickel-plated or stainless-steel housing replacing iron or steel which affects pH value of the liquid under test.

While the N.G.A.A. committee has directed its work mainly along the lines of cause study and testing of inhibitors, the N.A.C.E. is supplementing with a study of alloys in an effort to find economic solution to the problem on a permanent basis. Corrosion engineers attended the general committee sessions and held their own meeting, under the chairmanship of Walter Rogers, Gulf Oil Corp., Houston. Next quarterly corrosion meeting will be held in Dallas January 21 and 22.

PAW Group Plans Buffet During A.P.I. Meeting

A "Bureaucrats' Buffet," to reunite former members of the Petroleum Administration for War, is being planned for Tuesday, November 12, in the Stevens Hotel in Chicago during the twenty-sixth annual meeting of the American Petroleum Institute.

The affair will be the first social gathering of PAW "alumni" on a national scale. It was emphasized the meeting is purely social. All who plan to attend have been asked to send registrations, with $5 registration fee, to Lee Cowles, 910 South Michigan Avenue, Chicago, treasurer of a committee of former PAW members arranging the meeting.

Another feature during the A.P.I. meeting was announced by the American Society for Testing Materials. A forum on diesel fuels will be held the morning of November 13 in the Blackstone Hotel to explore both present and future operation of diesel equipment and the situation in obtaining distillate fuels by geographic distribution. The forum will be under the direction of Technical Committee F on diesel fuels of Committee D-2 on petroleum products and lubricants with E. W. Isom, Sinclair Refining Co., as chairman. Major industry and engineering organizations concerned with diesel fuel have been invited to participate. The program for the main A.P.I. meeting was carried in The Oil and Gas Journal, October 19, page 103.

Tideland Leases Offered

BATON ROUGE, La. — The Louisiana Mineral Board last week advertised for mineral lease about 1,740,000 acres of Gulf of Mexico water bottoms adjacent to the Southwest Louisiana Coast. Bids will be received until 9 a.m., November 2, and offerings include acreage in three general locations. This is the third offering in recent months of sections of the tidelands to which Louisiana claims title.

No T-3's, But Many Other Tankers Still Available

WASHINGTON.—Plenty of surplus tankers of the smaller and medium sizes are available for purchase, according to the quarterly report of ship sales just made by the U. S. Maritime Commission.

The T-3 type tanker, largest, fastest, and most desirable ship for general commercial operation, is not available, however. Only five have been declared surplus to date, and these were sold immediately. The others, all built during the latter days of the war, are still being used by the Army or Navy.

Of the T-2 type, also a modern tanker, the commission has some 350 more vessels on hand than applications to purchase, and it also has available large numbers of T-1 or coastal tankers, tankers converted from Liberty ships, and special types.

The status of the tanker-sales program as of September 30 is shown in the accompanying table:

STATUS OF TANKER SALES

	T-1	T-2	T-3	T-Specl.	Liberty tankers	Total tankers
Purchase Applications Pending September 30						
U. S. citizens	..	9	..	6	2	17
Foreign governments	..	..	..	2	..	2
Foreign individuals	4	49	..	..	..	53
Total applications	4	58	..	8	2	72
Declared Surplus But Unsold September 30						
Merchant type	28	401	..	3	42	474
Military type	2	25	..	7	19	53
Total supply	30	426	..	10	61	527
Sales Approved (Cumulative to September 30)						
Citizens	1	28	5	1	..	35
Foreign governments	..	1	..	..	..	1
Foreign individuals	..	..	..	..	..	..
Total sales	1	29	5	1	..	36

WASHINGTON WATCHING

BY HENRY D. RALPH

The End of the Control Era

WASHINGTON.—There is virtually no possibility that petroleum and its products will again be placed under price control as a result of administration actions during the week since President Truman directed an end to price controls on meat.

The administration has done a complete aboutface on the subject of a controlled economy and is now moving rapidly toward decontrol in almost every field. Within a month or two the only important wartime controls left will be prices of basic materials, rents, construction, and exports.

There are only two contingencies which might bring a return of oil price control. One is that the currently predicted advance in crude prices should come soon and be very substantial. The second is that the administration might again reverse its position and make another attempt to hold down living and business costs.

This latter possibility is most remote, particularly if the November 5 congressional elections turn out as most political prognosticators predict. The Office of Price Administration and the Price Decontrol Board will remain in existence until next June, unless Congress repeals the law, but they are expected to be virtually moribund. Early in the next session Congress must be asked for funds to keep them alive the balance of the fiscal year, but there is little present prospect that they will get much.

Staff Is Reduced

The Decontrol Board has voluntarily reduced its staff and has gone on a part-time basis, and the chief activity in OPA at the moment is finding new jobs for the hundreds of employes who are being dropped. Technically, at any time within the next 6 or 8 months OPA could ask the Decontrol Board to reimpose oil price ceilings, but the possibility is too remote for serious consideration.

Very shortly OPA will issue a list of articles on which price controls should be retained until next summer, and all others will be dropped. Such a list was required by Congress by December 31, but it will now come sooner and be much smaller than was planned a couple of weeks ago. It will consist principally of consumer durable goods, textiles, farm implements, construction materials, and basic industrial raw materials.

Export controls on scarce commodities may be continued for some months, though many in the administration think most of them will not be really necessary for long. The Civilian Production Administration would do away with all priority and allocation controls by the end of the year if it were not for the continued pressure to expand the veterans' housing program. However, there is a question how long the administration can keep a tight lid on nonhousing construction, and Congress may take another look at the housing program soon after it convenes in January.

The Campaign Comes First

A PROSPECTIVE congressional investigation of big business and monopoly practices blew up when the House small-business committee canceled its hearings on concentration of economic power because its members were too busy campaigning for reelection.

Instead the committee will make a report to the next Congress based on material being supplied it by the Commerce and Justice departments and the Federal Trade Commission. It's a fair guess that these agencies will point with alarm at the growth of big companies and will suggest legislation to prevent integration of different business activities within a single corporation, plus ample appropriations to themselves for policing the antitrust and related laws and to assist small business in various ways.

This report quite likely will touch off a congressional battle against "monopoly," which is always good left-wing political tactics. A move may be made to create a permanent congressional economic committee to make continual investigations of business trends and practices, something like the old Temporary National Economic Committee which investigated almost everything just before the war.

Cost of NPC Membership

CONTRIBUTIONS to pay operating expenses of the National Petroleum Council have been asked of all members by Walter S. Hallanan, temporary chairman, in accordance with the action taken at the last council meeting.

While no schedule of expenditures has been approved, the council authorized solicitation of one-half of an estimated budget of $50,000 per year, so each member is being asked to contribute a proportionate share of $25,000. Since there are 85 members, the semiannual "dues" figure out at $294.12 per head.

Hallanan's letter made it plain that retention of membership on the council is not dependent on financial contributions. Because of the contingency that some of the brethren may be slow in kicking in, Hallanan pointed out that there is nothing to prevent the treasurer from accepting contributions larger than the pro rata share or from persons in the petroleum industry who are not members of the council.

This form of financing might eventually lead to a charge that a small segment of the oil industry dominates the council through control of the purse strings, and the subject doubtless will be considered at later NPC meetings. One suggestion has been made that every company or trade association having a member on the council pay a flat annual dues of, say $500 or $1,000. This would spread the financial burden evenly and might automatically confine membership to those who are sufficiently interested to take an active part in the council's program.

A Move for Efficiency

THE long-standing controversy and overlapping between the Bureau of Mines and the U. S. Geological Survey is about to be resolved as a result of a special coordination committee set up last spring by Secretary of the Interior J. A. Krug.

A mutual agreement has been reached—or at least a policy decision has been made—that Mines will drop all exploratory work of searching for new minerals, and the Survey will drop its conservation branch and the administration of the production of oil and minerals on public and Indian lands. Details are yet to be worked out, and there will be some transfers of funds and personnel between the two bureaus.

For years the oil and mining industries have been both confused and amused at the competition, conflict, and duplication between these two agencies of the same department. It started back in the Hoover administration when most of the Bureau of Mines was transferred to the Commerce Department, leaving some remnants to be incorporated into the Survey. Then Mines was shifted back

to Interior but U.S.G.S. didn't give up its inheritance of public-land administration. The feud got very bitter and reached the point of personal vendettas between some officials of the two bureaus, and Secretary Ickes, who claimed to be a great and efficient administrator, never solved the difficulty. The two agencies competed in seeking appropriations for parallel activities, much to the confusion and irritation of congressional committees.

The Survey accused Mines of ignoring its geological studies, using engineers to do geological work, and doing core drilling and other exploratory work in unlikely spots in a frantic search for war-needed materials. Mines accused the Survey of using geologists to do the work of production engineers and administrators in supervising production and leases on public lands.

The new program is designed to return each bureau to its original concept and make one big happy family out of Interior's children. It may be some time before the transfers are completely ironed out, but the Department's next budget should make a good deal more sense from the standpoint of the oil and minerals industries.

New Leasing Regulations

NEW regulations under the amended oil and gas leasing act should be ready for promulgation within a couple of weeks. The Bureau of Land Management is putting the finishing touches on the legalistic verbiage required to embody the agreements in principle reached at the Denver conference with industry representatives September 30.

Interior Department officials are confident they will have a set of regulations which will meet wide approval of the oil and gas industries and which will lead to much greater exploration and development on public lands. A prospect of delay arose when the National Petroleum Council appointed a special committee to make recommendations on the leasing regulations, but it now appears that this group will endorse the position taken by other industry spokesmen at Denver so there will be no conflict of views nor reason for postponing final action.

Connally Act Enforcement

A SHAKE-UP in the Federal Petroleum Board and other administrative machinery for enforcing the Connally "hot oil" act may follow a study now being made by Ralph K. Davies, acting director of the Oil and Gas Division. A number of employes in Texas were let out recently following the completion of work they had been doing for the old Petroleum Administration for War, but those who are left account for about half of OGD's budget, and Davies suspects the money might be used to better advantage on other activities.

For several years enforcement of the Connally act has been routine, and while a certain number of violations have been turned up each year there is a question whether federal aid is really necessary to enforce state conservation laws. The act can't be abandoned without congressional action, but the enforcement staff might be whittled down to a mere shadow.

Natural-Resources Inventory

AN inventory of our natural resources to serve as the basis of a national oil and minerals policy was one of the first objectives announced by J. A. Krug when he became secretary of the interior, and he still is pushing the project, but it is taking a lot longer than he anticipated.

Krug has been criticized for warning the oil industry that it must prepare for substantial imports of petroleum when he is not prepared to say how much is "substantial," so he is more anxious than ever to formulate a definite resources policy. He discussed the subject somewhat at the recent convention of the American Mining Congress and may mention it when he addresses the American Petroleum Institute, but as nearly as can be ascertained, his plans are not very far along.

The bureaus within Interior are all for the project but most of them look on it in terms of large appropriations with which they can conduct lengthy projects of geological mapping, geophysical and core-drilling prospecting, laboratory research, and economic studies to discover our undiscovered resources and utilize low-grade deposits. In 20 years or so, if enough money is appropriated, such a program might provide fairly definite estimates as to when we will run out of oil, lead, copper, etc., but wouldn't contribute much to the current economic and political problems of the oil and minerals industry.

A Chronic Lead Shortage?

ANOTHER attempt to stir the administration into doing something about the lead shortage has been undertaken by Fayette B. Dow, general counsel of the National Petroleum Association, who has written half a dozen government agencies that the lead situation has grown steadily worse since the Office of War Mobilization and Reconversion held an interdepartmental meeting on the subject last April.

Pointing out that the metal obtainable for production of tetraethyl lead is far below the meager quota set by the Government, Dow said inventories of ethyl fluid have been reduced to a dangerous point. He asked that all federal agencies join in doing something to get more lead into industrial channels.

While no answers have yet been received, it is doubtful that Dow's request will bring early results. To all appearances, the administration has given up lead as an impossible situation and is resigned to a chronic lead shortage. About the only thing the Government has done in recent months is to juggle the allocations a bit among the various claimant industries, and production has not been increased materially.

The mining industry (and not a few government officials) say the only answer is to remove price ceilings and let the price of lead rise sufficiently to attract more imports and induce greater exploration and new production. In spite of its new decontrol tack, the administration shows little inclination to adopt this remedy, adhering to the position that lead must remain "stabilized" since it is a basic commodity in short supply.

Krug's Letter to Colley

TO combat any apathy which might have spread in the National Petroleum Council by the resignation of Robert H. Colley, president of Atlantic Refining Co., all members of NPC have been sent copies of a letter written Colley by Secretary Krug.

"I have the utmost confidence," Krug wrote, "that the performance of the council and the splendid contribution which I know it will make to the advancement of the national interest will demonstrate conclusively that your misgivings are totally without foundation."

Krug said it was extremely discouraging to hear Colley's view that only the extreme urgency of war can justify government-industry cooperation in seeking solutions to common problems. He pointed out that since the President directed formation of the council to serve as a channel of communication between the federal Government and the petroleum industry, every oil and gas matter within the jurisdiction of the federal Government is a proper subject for discussion and advice of the council.

The secretary challenged Colley's opinion that the antitrust law unduly restricts NPC activity, saying, "on the contrary, it leaves open the broadest field of activities for council consideration." He also ridiculed Colley's reference to statistical studies as "ancient history," saying that the proper solution of most problems depends on analysis of pertinent data and the council would want adequate information before acting on any matter.

24,000 GMV HORSEPOWER at Lion Oil

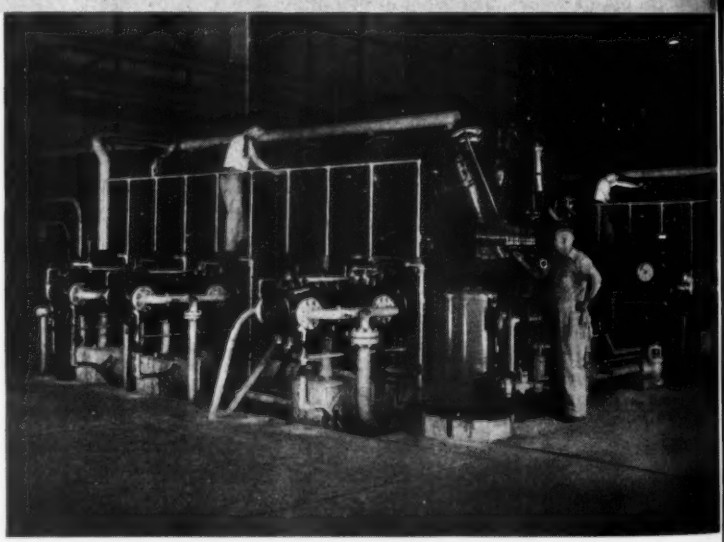
From Blockbusters to Famine-busters!

HERE is an example of how America's engineering and production ingenuity can often convert machinery of war into peacetime instruments for nation-wide, even world-wide betterment.

In this vast ordnance plant, originally dedicated to wartime destruction, big Cooper-Bessemer engine-driven compressors are still helping to produce synthetic ammonia from natural gas. Up to 500 tons are produced here daily . . . but no longer for the making of high explosives. It is now converted into ammonium nitrate fertilizer.

There are of course hundreds of important uses for ammonia. Used for conversion to critically needed fertilizer, it will go far as a "famine-buster" to help grow crops to feed a hungry world.

This is one of the largest compressor installations ever made — 24 Cooper-Bessemer 10-cylinder gas engines, delivering 24,000 compressor horsepower. During the war years and on into peace these units have been demonstrating the long-range dependability and efficiency that GMV users in *all* fields have learned to expect from these modern Cooper-Bessemers.



Close-up of one of the 24 GMV's installed at Lion Oil Company's El Dorado Chemical Plant. Twelve, of which this is one, are high-stage units automatically controlled to match exactly the process demand at all times.

TYPE GMV ANGLE Compressors

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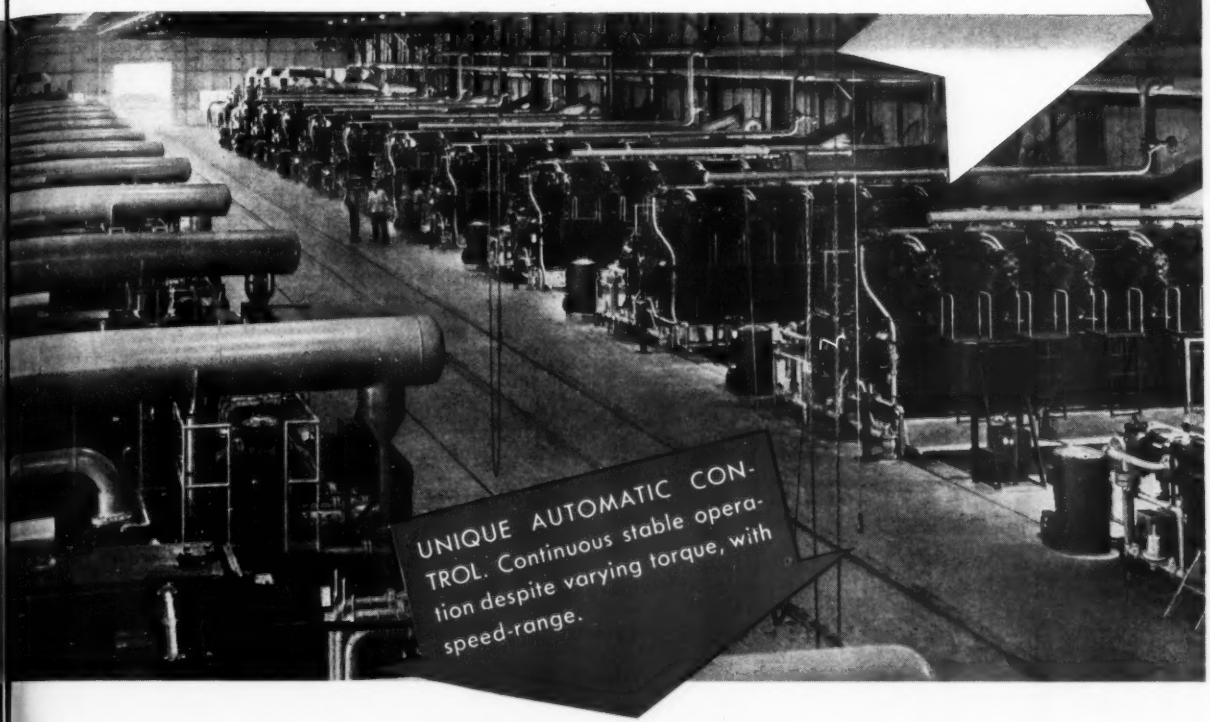
Company's El Dorado Chemical Plant



One feature of this big, 24-unit compressor installation is the system of automatic control. Two pneumatic pressure controllers regulate the speed of 12 of the compressor engines from 150 to 300 rpm to maintain a constant suction pressure to the 12 high stage compressors.

This type of automatic control successfully holds pressure or flow rate within an accuracy of 1%, with the least possible disturbance to the balance of the process. Due to low engine speeds, fuel and maintenance costs are exceptionally low. Instead of the conventional hydraulic or mechanical governor, Cooper-Bessemer's patented Exact Rate Governor speed control is used. It is ideal in this kind of installation, offering many advantages where continuous stable operation is necessary under varying torque and over a wide speed range. There is no appreciable "dead" zone of control correction. The rate of fuel correction, after a speed deviation, is not fixed, but is proportional to the rate of deviation. The instrument adjustments permit the rate of correction to be better regulated for the individual engine. Also, the Exact Rate Governor control permits direct, manual regulation of the amount of fuel for starting, resulting in easier, quieter, and *better* starting.

These are only a few of the advantages this one Cooper-Bessemer feature is bringing to various users in the chemical and petroleum industries. And it is only one of many outstanding GMV features.

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The continuous assistance of Houdry Laboratories and engineers, plus the undisputable advantages of Houdry's small TCC unit, enable the small refiner to meet competition of any strength.

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Russian Pipe Order Canceled After Protest

AN order from Russia for 183 miles of steel pipe from A. O. Smith Corp., Milwaukee, was scheduled for cancellation last week after Gov. Earl Warren of California protested to the State Department in Washington that it would seriously delay construction of the Texas-California natural-gas pipe line.

Undersecretary of state notified Governor Warren that UNRRA would cancel the Russian order. Government officials said the decision to cancel the order was taken because the manufacturing company could not begin delivery until April—4 months after UNRRA is to be dissolved in Europe.

Officials of the Treasury Department in Washington, which placed the pipe order at UNRRA's request, said the order carried no priority or preference. Clayton told Governor Warren the cancellation would be effective October 21 and that the Russian Government would be notified of the action.

In a telegram to Clayton, Governor Warren said:

"My attention has been called to the serious delay which would be occasioned in construction of the 1,200-mile natural-gas pipe line from Texas to California if a pipe order for Russia is placed in preferential position on the manufacturing schedule of A. O. Smith Corp., of Milwaukee.

"After extensive hearings, both the California Railroad Commission and the Federal Power Commission rendered decisions authorizing construction of the line as a necessity for continued service of natural gas to over 1,000,000 homes in Southern California."

L.P.G. Pressure Tank-Car Outlook Appears Brighter

WASHINGTON.—Few, if any, additional pressure tank cars will be taken away from the liquefied petroleum gas industry in the immediate future, it now seems assured as a result of coordinating action being taken by the Office of Defense Transportation and a number of other federal agencies.

Under instructions from the Office of War Mobilization and Reconversion, ODT is perfecting ways of increasing the utilization of government-owned and other pressure tank cars by reducing crosshauling and turnaround time, is attempting to speed up construction of new cars, and may allocate existing and new cars among various services.

The Army has not agreed to curtail its program of producing fertilizer for use in occupied enemy territories, but it is believed it will postpone or at least reduce its demands for the return of liquid-ammonia cars now leased to other uses.

During the interdepartmental conferences the charge was raised that L.P.G. shippers have greatly expanded their sales commitments beyond their ability to ship and perhaps even to produce, the inference being that they are not entitled to special consideration since they are dependent on cars leased from the Government which might be withdrawn at any time.

Penn State Sets Conference On Secondary Recovery

STATE COLLEGE, Pa.—D. T. Ring, Columbus, Ohio, president of the Pennsylvania Grade Crude Oil Association, and E. G. Dahlgren, Oklahoma City, assistant secretary of the Interstate Oil Compact Commission, will speak at a dinner featuring the tenth annual Secondary Recovery Conference at Pennsylvania State College, November 1-2.

Roy E. Bailey, Wolf's Head Oil Refining Co., Oil City, Pa., and E. M. Tignor of the U. S. Bureau of Mines, Franklin, Pa., will be cochairman of the opening technical session November 1. Presiding at the meeting the following morning will be John F. Buckwalter, Ryder-Scott Co., and John DePetro, both of Bradford.

Members of the college school of mineral industries staff will deliver reports of investigations at technical sessions. The program follows:

November 1

"Capillary Pressure and Capillary Diaphragms in Secondary Recovery, J. W. Amyx and K. W. Smith; "Selective Plugging With Smoke in Air-Gas Drive," R. F. Nielsen; "Water Flooding Test on Long Cores," R. A. Morse; "Chemical Agents in Water Flooding," P. L. Terwilliger. The conference dinner will be at 6:15 p.m.

November 2

"Progress Report on Air-Gas Drive Research," D. E. Menzie; "Studies on Permeability Determination," J. C. Calhoun and Dr. S. T. Yuster; open forum on oil production problems.

Pure Oil Co. Receives Water-Flooding Permit

Pure Oil Co.'s program to conduct water-flooding operations in Cumberland field of Marshall and Bryan counties, Oklahoma, to boost recovery of crude oil and dispose of salt water, has been approved in a hearing before the State Corporation Commission.

The company said the plan is to use about five of the 10 nonproducing wells around the edges of the field to launch the water-flooding program and that the McLish sand zone will be the first used in testing the new operations. More wells will be used as the program progresses.

East Coast Terminal Opened

NEW YORK.—Socony-Vacuum Oil Co., Inc., has opened another new East Coast marine terminal at Wilmington, N. C. The installation on the east bank of Cape Fear River includes four tanks with a capacity of 10,120,000 gal. First delivery of products to the terminal was made last week by the company tanker, Siwanoy. The company earlier announced the opening of another new terminal at Norfolk, Va., which also received its first shipment of products from the Siwanoy.

Starting Next Week in the Journal—

ONE of the most intensively studied reservoir-engineering subjects in the past few years has been the role that "water drives" play in oil production, whether by natural causes or by purposeful injection. Next week's Journal starts the first of a number of articles on this subject, which have been especially prepared by Park J. Jones, prominent consulting engineer of Houston. Each article is a separate entity in dealing with the different divisions and parts of this work, with the general heading being "Oil Production by Water." The material is given in an entirely new form and much of it represents hitherto unpublished information and new approaches from the engineering standpoint.

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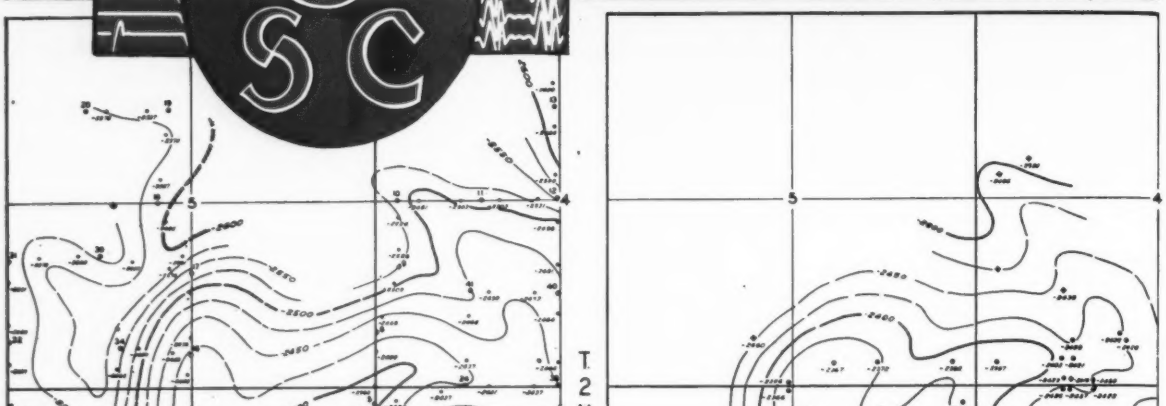

S S C reflection seismograph map made after first well was drilled.

Structural map made from drillers' logs after partial development.

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— The accurate revealing of geologic structure is fundamental to successful prospecting for petroleum. In this regard S S C, by providing a reliable and competent service, is helping to assure "Oil Will Be Discovered."

Seismograph Service Corporation

TULSA, OKLAHOMA, U. S. A.

New Carolina Test Planned; Maryland Drilling Starts

NEW YORK.—Standard Oil Co. of New Jersey has begun drilling on its second East Coast exploratory well. The well, located 3 miles north of Ocean City, Md., is the 1 Maryland Esso and will be directed by K. D. White, in charge of the company's development program along the Atlantic Coast.

The well is to be drilled to at least 5,000 ft., depending upon geological sections penetrated. Jersey Standard holds leases on approximately 80,000 acres of state-owned lands in the area of Sinepuxent, Chincoteague, and Assawoman bays. The company's first attempt, at Cape Hatteras, was dry at 10.054 ft.

The company also announced last week a site at Pamlico Sound, 17 miles from Manteo, N. C., and 32 miles north of Hatteras Light, has been selected for another North Carolina test which will be the first overwater drilling ever attempted along the Atlantic Coast. The new well, North Carolina Esso 2, will be located about 3 miles west of Barrier Beach, where the depth of the water is 5 ft. Drilling will start upon the arrival of a large sinkable barge now under construction in New Orleans, it was announced.

Launching Ceremonies Held For Radar-Equipped Tanker

CHESTER, Pa.—With many top-ranking officials present from Standard Oil Co. of California, affiliates, and other companies, the first radar-equipped tanker to be built postwar in the United States slid off the ways here October 21, at the Sun Shipbuilding & Dry Dock Co.'s shipyard.

The "R. G. Follis," sister ship of the recently launched "F. S. Bryant," was named for the president of California Standard. Mrs. Follis christened the ship.

With a capacity of over 100,000 bbl., the tanker is equipped for high-speed loading and unloading with seven pumps having a total capacity of 10,500 bbl. per hour.

Among the California Standard officials present from the West Coast were Follis; H. D. Collier, board chairman; J. L. Hanna, vice president and director; A. N. Kemp, director; J. H. MacGaregill, vice president; Atholl McBean, director.

Others present included John G. Pew, president of Sun Shipbuilding; Eugene Holman, president of Standard Oil Co. (N.J.); B. Brewster Jennings, president of Socony-Vacuum Oil Co., Inc.; Howard M. Herron, board chairman of Bahrein Petroleum Co., Ltd.; Torkild Rieber, president of Barber Asphalt; D. J. Hanna, vice president of California Texas Oil Co., Ltd.; Clarence E. Olmsted, director of Arabian American Oil Co.; E. W. Enter, president of California Oil Co.; and W. R. Boyd, Jr., president of American Petroleum Institute.

Suit Filed Over Kansas Well-Allowable Order

GREAT BEND, Kans.—The Kansas Corporation Commission's recent order establishing a 15-bbl. daily minimum allowable in Kansas was contested here last week by seven members of the Kansas Independent Oil and Gas Association and Atlantic Refining Co. in a suit filed in District Court. W. H. Bird, association president, said that the 15-bbl. ruling is contrary to law and to evidence submitted at hearings and that the commission failed to take into consideration all the legal powers it holds, including the power to consider economic waste.

Alleging a 25-bbl. minimum is necessary to prevent economic waste, the petition filed states that the 15-bbl. order will result in "great and irreparable damage to plaintiffs and a loss of natural resources to the state."

Jersey Standard Employes Get Cost-of-Living Bonus

NEW YORK.—To help cover recent increases in the cost of living, all wage and salaried employes except executives of Standard Oil Co. (N. J.) and its affiliates will get a week's bonus, officials said here this week. The payments are entirely voluntary and do not change basic wages or salaries.

Earlier this month, Humble Oil & Refining Co., a company independently operated but whose stock is held largely by Jersey Standard, announced that a temporary cost-of-living allowance of $25 a month would be paid its employes for a period not to exceed 4 months commencing in October. Humble Pipe Line Co. employes are to participate in an identical bonus plan. Carter Oil Co., another Jersey Standard affiliate, announced employes on the payroll as of October 15 a week's extra pay as a cost-of-living allowance. Some other oil companies reportedly are considering the adoption of a similar cost-of-living bonus plan.

Producing Properties Sold In Two Oil Transactions

Producing properties in Texas, Kansas, and Oklahoma changed hands in transactions announced last week which involved more than $5,000,000.

In Dallas, Leland Fikes, independent operator, announced his purchase of producing properties of Maguire Industries, Inc., consisting of 74 wells in Texas and Kansas and 9,000 acres of leases. Consideration was about $2,000,000 in cash and oil production. Fikes plans to drill about 25 additional wells to develop the leases.

In Tulsa, Stanolind Oil & Gas Co. disclosed it had exercised an option and purchased all stock of Ramsey Petroleum Corp. for about $3,250,000. Most Ramsey producing properties are in Cement field, Caddo County, Oklahoma, with some production in Pauls Valley, East Pauls Valley, and Hoover pools. Present daily net production is approximately 1,350 bbl. Ramsey also owns approximately 5,000 acres of nonproducing leases in central and western Oklahoma.

Atlantic Refining Building New Dallas Laboratories

DALLAS.—Construction is now under way on the new Atlantic Refining Co. laboratories here which will house offices, laboratories, conference rooms, and storage facilities for Atlantic's domestic producing organization and for Dallas branches of the research and development and transportation departments.

The new structure, an all-masonry, one-story building, will be 350 ft. in length and will contain 38,700 sq. ft. of floor space. Garage and automotive repair shop will have a total of 10,500 sq. ft. of floor space.

The building, being built in an area removed from the Dallas downtown section, will be the headquarters of various company personnel now scattered in other parts of the city. The building will be set well back from the street to avoid vibration from large vehicles which might affect operation of some of the delicate laboratory instruments to be installed.

Texas Railroad Commission Plans Statistical Unit

AUSTIN. — Olin Culberson, chairman, Texas Railroad Commission, has announced plans for a new Oil and Gas Statistical Division starting September 1, 1947, and an increased budget covering all operations next year.

The statistical section, he said, will meet a long-felt need. The budget for the Statistical Division, as submitted to the Board of Control, includes $63,600 per year for salaries and $15,000 a year for expenses. Itemized salaries include an attorney and a senior engineer at $4,200 a year each, a draftsman and 14 accountants, each at $3,000 annually, and four stenographers, each at $1,800 annually.

Marketers Await Winter to Reverse Stock Trend

A FEW varieties of burning oils showed slight strengthening in Mid-Continent petroleum markets this week, although the main volume movement of the winter season had not yet started.

Market experts held to their predictions of record high consumption the coming winter which, they believe, will justify the heavy stocks of these products piled up by the industry in recent months. Suppliers recall their experiences in last winter's short supply when they were weeks behind on orders and some refiners were providing more expensive lighter blends to meet certain burning-oil commitments.

One refiner said No. 1 prime white seemed to be in better demand than other burning oils. Another reported calls for No. 2 were picking up. Suppliers generally were awaiting colder weather requiring northern jobbers to replenish storage.

In the New York area, a break in the price structure for the light heating oils was seen by some sources if mild weather continues. This possibility was held due to lack of storage. One report said "not a gallon of free storage is left in the New York harbor area" for heating oils. No. 2 oil prices were reported being shaded already. Kerosene was relatively tight. No. 6 seemed plentiful, due in part to the shipping strike and not as much need for bunkers, it was said. The East Coast gasoline picture appeared unchanged.

American Petroleum Institute figures for the week ended October 12 showed a 2,379,000 bbl. jump in burning-oil stocks. The total of kerosene, gas oil, distillate and residual fuel oil stocks at 144,296,000 bbl. as compared to 141,817,000 bbl. the previous week and 102,289,000 bbl. the corresponding 1945 week.

Spot-market prices for motor fuel were reported to be ranging as low as 6½ cents for regular in the Mid-Continent area. A continued good demand, however, was reported in gasoline moving under contract with prices ranging around 7 cents.

The natural-gasoline market was erratic. Demand was reported extremely strong for the 26-70 grade—the market base, but daily prices fluctuated from 4½ to 4¾ cents in the Mid-Continent area and 4 to 4¼ in North Texas. Several suppliers were not quoting for 26-70. Another marketer said he was ready to pay 4⅜ cents for up to 30 cars of North Texas natural gasoline, despite the posted market low.

In California, congestion of packaged petroleum products resting on the docks at marine terminals and at refineries continued this week to exert pressure on the refined-product market. Prices were unchanged from the previous week, although an occasional offering at greater concessions was reported.

Most small refiners were hard pressed for operating space in limited storage facilities, and unless the maritime tieup ends relatively soon the general level of motor-fuel, diesel, and stove-oil prices was expected to yield again.

Added to the general stagnation of market operations caused by the maritime strike against dry-cargo vessels was a new threat against tankers which have been unmolested previously. The National Maritime Union threatened action against The Texas Co. tankers, alleging a dispute over a portion of the existing contract.

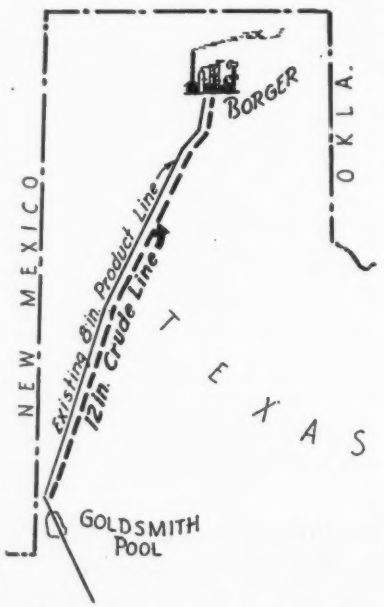
There is no recession in demand for Pacific Coast petroleum products, marketers insisted, but the necessity to move products on a current production schedule at small refineries cannot be resisted over an extended period.

Phillips to Build Goldsmith-Borger Line

BARTLESVILLE, Okla. — Standish Pipe Line Co., a wholly owned subsidiary of Phillips Petroleum Co., has completed plans to build a 289-mile, 12-in. crude-oil pipe line from Goldsmith in Ector County, West Texas, to Borger in the Texas Panhandle.

An announcement by Frank Phillips, board chairman, and K. S. Adams, Phillips Petroleum president, said the line will bring oil from the Permian basin sector of West Texas to augment the crude supply for Phillips' Borger refinery.

Maximum capacity of the new line will be 70,000 bbl. daily, with the initial load estimated at 50,000 bbl. daily. At present, Phillips has daily production of more than 35,000 bbl. in the Permian basin area and can increase this figure by further development of its extensive proved acreage, the announcement said.



This map traces the route of the West Texas-Texas Panhandle crude-oil pipe line to be built by Standish Pipe Line Co., a Phillips Petroleum Co. subsidiary

Phillips was reported earlier (The Oil and Gas Journal, October 5, page 38) to be considering a line from West Texas via Borger to Cushing, Okla., but the announcement last week said plans for a proposed 10-in. line from Borger to Yale, Okla., about 17 miles north of Cushing, have been deferred for the present.

Construction of the Goldsmith-Borger project will start when the necessary pipe is available.

Phillips now has an 8-in. products line extending generally from the Goldsmith area to Borger which was built to carry natural-gasoline plant products.

DEATHS

William Reid Loggie, 68, independent oil operator of Albany, Tex., died October 13 in Red River, N. M.

William Lewis Miles, 77, retired drilling contractor, died October 16 in Tulsa.

John Alvin Shoemake, 47, oil broker of Wichita, Kans., died October 17 in Casper, Wyo.

Guy L. Westerman, partner of Westerman Brothers Tank & Boiler Works, Bremen, Ohio, died October 22.

John Marston, assistant manager of the Venezuela office of the Seismograph Service Corp., was killed October 21 in a plane crash near Menominee, Mich.

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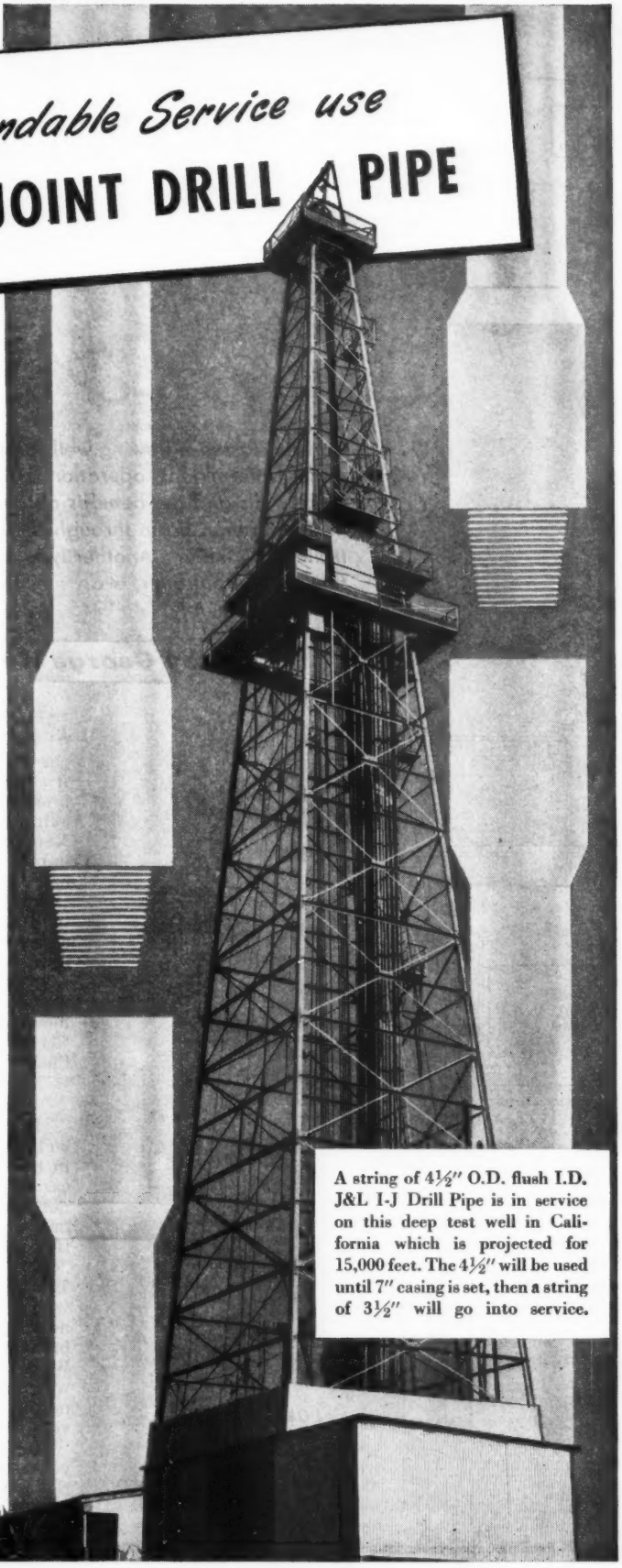


A string of 4½" O.D. flush I.D. J&L I-J Drill Pipe is in service on this deep test well in California which is projected for 15,000 feet. The 4½" will be used until 7" casing is set, then a string of 3½" will go into service.

Pressure-Controlled Intermitters

Certain classes of flowing wells produce most favorably under intermittent operation. This article describes these wells and the benefits obtained in several fields in the Permian basin through the use of pressure-controlled intermitters. Another type of this equipment, the time-cycle controller, was similarly described in an article in the July 14, 1945, Journal, pages 107-111.

by George Weber

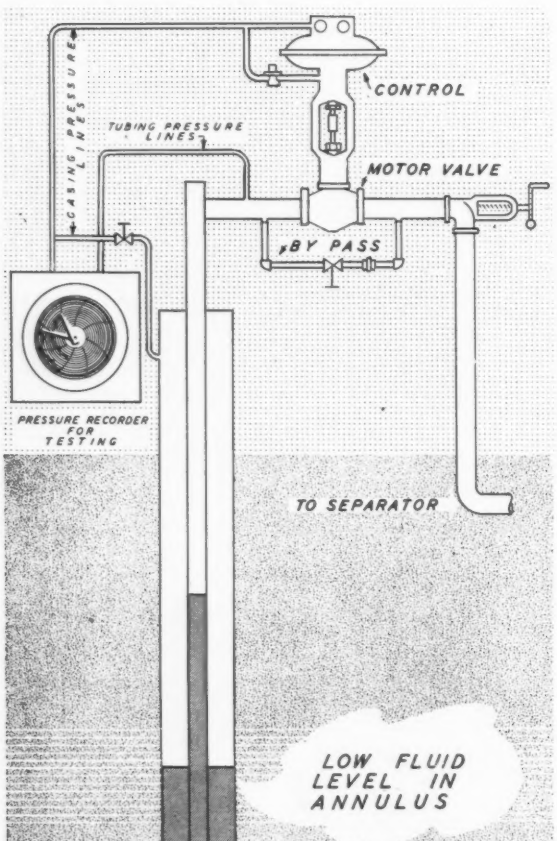


Fig. 1—Recommended installation of pressure-controlled intermitter

PETROLEUM engineers in the Permian basin are constantly confronted with the problem of controlling high gas-oil ratios. A satisfactory solution to this problem, as it applies to certain types of wells, is afforded by use of pressure-controlled intermitters. These well controllers are being widely studied in several fields of West Texas and New Mexico. Their success in reducing gas-oil ratios and improving oil production indicates their widespread use on certain classes of wells.

Any reduction of gas-oil ratios in flowing fields pays multiple dividends. Actual ratios in some fields have increased to the point where they have become the major proration factors, reducing oil allowables in the extent that they exceed the field ratio limits set by the Texas Railroad Commission. In such cases, lowered gas-oil ratios mean increased allowables for oil. But the important benefits accruing from reduced ratios concern conservation of the gas itself, and the energy it represents in the reservoir.

Type of Wells Benefited

Pressure-controlled intermitters are best adapted to wells showing two characteristics: (1) Low fluid levels in the annulus between casing and tubing, and (2) erratic casing-pressure buildup following shutin. Such wells will not flow continuously on a fixed choke setting at uniform pressures. They are commonly high-ratio producers when flowed manually since they show a marked tendency to "blow" dry gas after varying periods of oil production. This is caused by a decline in the bottom-hole pressure, which allows built-up casing pressure to depress the annular fluid column to the bottom of the tubing string, breaking the fluid seal and allowing gas to bypass oil. When flowed manually, this type of well requires close watching if gas blowing is to be prevented. Lease labor has neither the time, nor in many cases the inclination, to devote such attention to each problem well.

Installation of smaller chokes extends the flowing period before the liquid seal is broken, but requires longer flowing time to make allowable, or reduces daily production. Time-cycle intermitters which allow flow between fixed intervals of time determined by clock settings, find wide adoption on such wells, reducing labor costs and

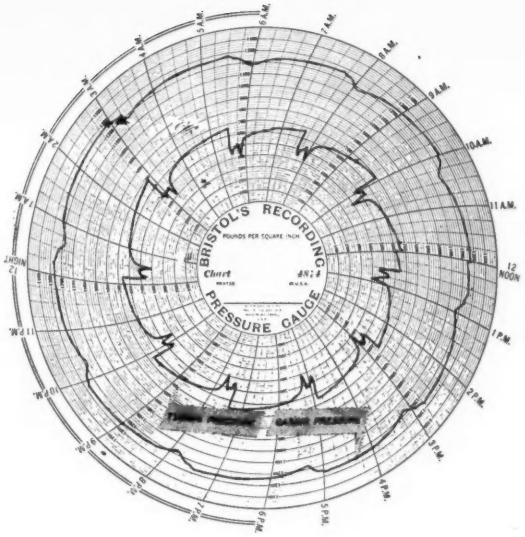


Fig. 2—Chart of an 85-bbl. well producing 10 times daily

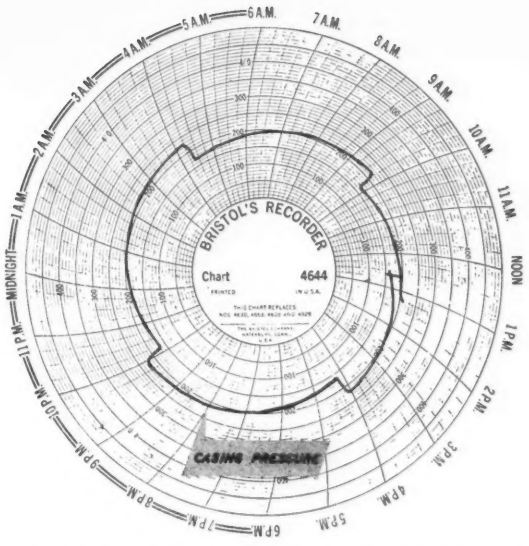


Fig. 3—Chart of marginal well producing at 5-6-hour intervals

better adapting well flow to individual well conditions. Other types of intermitters operate on actual well pressure and flow and shut in wells at predetermined casing pressures, thus regulating flow with relation to the liquid level in the casing.

Field Trials

Among the pressure-controlled intermitters, or stop-cocking devices installed in the Permian basin, Fisher Governor Co.'s controller employing the snap-acting "Wizard" pilot is being adapted to a wide range of wells. The controller was developed to meet the requirements of an operator producing small wells in two New Mexico fields, and later became the object of growing interest among engineers throughout the basin. At present about 15 companies have installed this type of flow controller in the following fields: Crane, Dollar Hide, Foster, Fullerton, Fuhrman, Goldsmith, Grandfalls, Hobbs, Loco Hills, Mentone, TXL, Turkey Track, Seminole, and Wink. A typical installation of the controller is shown in Fig. 1. It should be installed between the well and the choke, so that its snap action may be tested and adjusted while the well is shut in. Casinghead gas, after filtering, is conducted directly to the pilot mechanism which controls the flow valve. The same gas is connected through auxiliary regulators to the diaphragm motor valve where it serves as the operating medium for actuating the valve in the flow line.

A pilot on the controller is comprised of a pivoted flapper, one end of which is fixed to the tip of a Bourdon tube. Other end of the flapper lies opposite a nozzle or orifice in the casing pressure line which actuates the motor valve. As casing pressure declines during the flow period, the Bourdon tube contracts and stress on the flapper overcomes the pull of a magnet which held it tightly against the orifice in the casing-pressure line to the motor valve. As it snaps away from the magnet and the orifice, bleeding the casing pressure, the valve closes. As the well is shut in, casing pressure increases and the Bourdon tube expands, relieving the stress on the spring flapper until such stress is exceeded by the magnet's pull. It then snaps against the orifice, allowing pressure to build up and again open the well to production. The snapping range is widened or narrowed by moving the permanent magnet toward or away from the flapper. The snapping range, or the range between pressures which will open and close the valve, can be adjusted between 1 and 25 per cent of the nominal pressure rating of the Bourdon tube installed in the control. For example, a pilot with a 600-lb. Bourdon tube can be adjusted to any snapping range between 6 and 150 psi.

Such intermitters are now operating satisfactorily on wells with casing pressures ranging from 150 to over 1,500 psi. The production cycles also vary widely between wells, some kicking on or off every 45 seconds, and others flowing only twice daily.

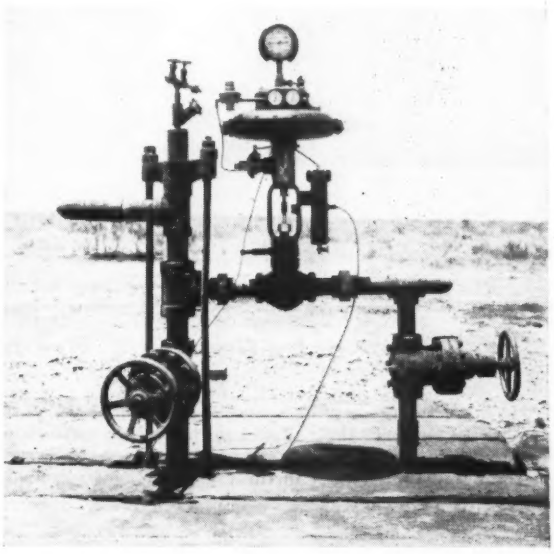
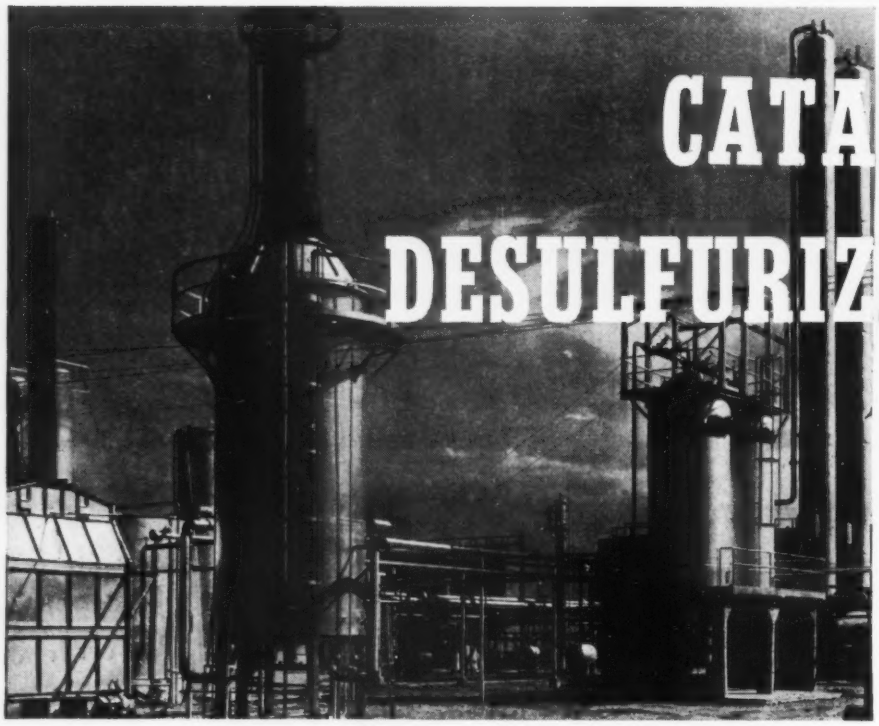


Fig. 4—Typical installation in Goldsmith pool

Actual operation is well illustrated by pressure-gage charts. Fig. 2 is a record of a well producing 85 bbl. daily between casing-pressure limits of 1,260 and 1,180 psi. The well flowed for about 20-25 minutes during each cycle, and opened at intervals averaging 2 hours and 20 minutes. However, build-up of casing pressure was irregular, and for the day tested, the well varied in cycles from 2 hours 7 minutes to as long as 2 hours 42 min-

(Continued on page 121)

Recent Advances in Perco



CATALYTIC DESULFURIZATION

Desulfurization unit of a Perco Licensee

Of Refinery Gasolines

by George M. Brooner and Miller W. Conn*

THE petroleum-refining industry has, in the past several decades of its existence, made rapid strides in technologic advancement in the art of making salable petroleum products. The industry has been and always will be confronted with a variety of current and impending problems occasioned by ever-changing product specifications and economic competitive considerations. World War 2 interrupted to a very great extent the natural economic development of the oil industry, and many installations were made with little economic consideration. Now that the war is over and the industry has reverted to a more or less normal level in product specifications, there is a very wide range among refiners in their capabilities for making products of ever-increasing octane-number specifications.

Taking the industry as a whole and in view of the greatly diverse refining facilities, the principal problem confronting refiners, and particularly small refiners, is the increased competition with respect to octane number. In considering this problem it has been generally overlooked that there are two distinct methods of approach. The so-called "Small Catalytic Cracking Processes" propose a solution by the installation of new facilities to produce increased yields of new products of improved quality. There has been a great deal of published information in the recent past on these processes. Unfortunately, however, these processes are usually beyond the sound economic reach of the average small refiner. Furthermore, a close study of facts will indicate that these units are justifiable primarily on increased yields of gasoline and secondarily on over-all refinery octane-number appreciation which is usually of the order of three to four numbers.

The present discussion is concerned with a different approach to this problem, namely, improvement in the quality of products produced on present equipment with a minimum of additional capital investment and operating charges. The processes to be discussed contemplate operating on either the total refinery blend as the feed stock or merely processing the lowest-octane components with a resultant over-all improvement equal to or greater than can be obtained by the catalytic-cracking processes. A study of any motor-fuel blend will reveal that there are many component fractions that are relatively low in octane rating. Obviously it is sound logic to process these low-octane components by taking advantage of their ready response to simple refinery techniques such as the processes hereinafter discussed.

Aside from the naturally low-octane character of some motor fuels, or of their separate component streams, it has been demonstrated definitely that sulfur in its various forms affects adversely the octane number[1] and tetraethyl lead susceptibility of motor fuels, a fact now well known to all petroleum refinery technologists. Sul-

*Perco Division, Phillips Petroleum Co., Bartlesville, Okla.

fur in petroleum products not only affects quite appreciably the detonation characteristics of motor fuels, but also contributes to the corrosiveness, poor gum, and color stability, as well as the odor of many finished products.

The advent of tetraethyl lead as an antiknock agent in automotive and aviation fuels has emphasized the adverse effects of sulfur in any finished fuel. It is not news to refiners that octane numbers have increased steadily in the past several years, as summarized by Crouch and Alden.[2] The depression year 1932 showed a decline from 63 to 62 octane number in what we now know as regular or house-brand gasolines. From that time, however, octane specifications have gradually increased from year to year, reaching 75 to 80 A.S.T.M. for regular and premium grades respectively at the time of our entry into the war. To what extent these octane trends will recover under a free and unrestricted postwar economy, no one dares hazard a firm prediction. Indications were that due to facilities installed during the war period house-brand and premium would go immediately to about 80 and 85 A.S.T.M., respectively. This, of course, has not been realized as yet due to conditions well known to the industry.

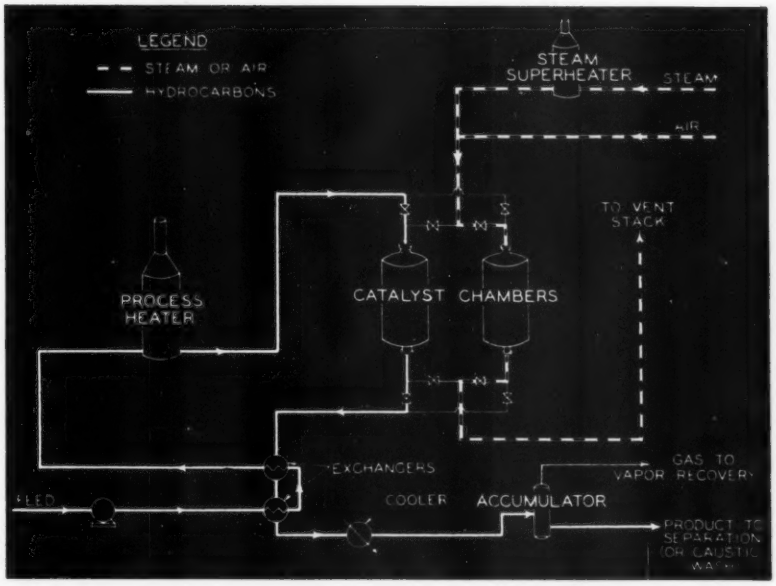


Fig. 2—Perco catalytic desulfurization and reforming

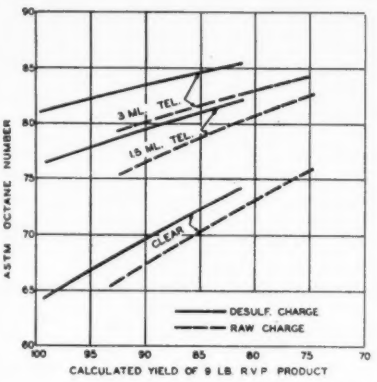


Fig. 1—Comparison of octane-yield relationship for raw and desulfurized thermal reforming charge

Whatever course the future may dictate, there is one thing certain—sulfur is one of the major problems in refining and blending motor fuels. Many refiners simply have done nothing about the problem or have resorted to obvious means of sulfur reduction such as acid treating and caustic washing. Just prior to the war several modified caustic-washing systems were advanced as a means of desulfurization[3,4,5,6] but like acid treating and conventional caustic washing these systems are inadequate or not too effective due to their failure to realize the marked octane improvement inherent in vapor-phase catalytic desulfurization.

Results of the first commercial Perco catalytic desulfurization installation were reported by Buell and Pew.[7] Subsequent to this installation a total of 24 such units have been installed and are now in operation on stocks from various types of crudes, including Michigan, Illinois, Montana, Wyoming, Slaughter, West Texas, and New Mexico. The sulfur content of the feed stocks charged to these units is a maximum of about 0.30 per cent on Slaughter straightrun and as low as 0.025 per cent on a light straightrun from Illinois crude.

During the war period several refiners were able, by means of catalytic desulfurization, to make aviation gasolines of 91 octane merely by low-

TABLE 1—COMMERCIAL RESULTS—PERCO CATALYTIC DESULFURIZATION STRAIGHTRUN GASOLINE

Unit designation, cap.	Plant "A," 1,000 B/D			Plant "B," 500 B/D			Plant "C," 2,000 B/D			Plant "D," 1,000 B/D			Plant "E," 5,000 B/D		
Crude source—	Oregon Basin-			Oregon Basin-			Howard-Glasscock			Michigan (pipe line)			Winkler-Monument		
Operation—	Riverton Desulfurization			Garland Desulfurization			Desulfurization			Desulfurization			Desulfurization		
Inspection data:	Before	After	Gain	Before	After	Gain	Before	After	Gain	Before	After	Gain	Before	After	Gain
A.S.T.M. oct. clear	52.0	55.9	3.9	52.3	55.9	3.6	61.8	64.3	2.5	44.8	46.8	2.0	59.6	61.4	1.8
Plus 1 ml. TEL/gal.	63.0	68.4	5.4	61.1	68.0	6.9	69.9	74.8	4.9	53.9	59.6	5.7	65.3	70.0	4.7
Plus 3 ml. TEL/gal.	72.2	77.9	5.7	70.7	77.0	6.3	77.5	82.5	5.0	63.4	71.5	8.1	70.9	76.5	5.6
Total sulfur, wt. %	0.069	0.006		0.082	0.013		0.149	0.019		0.056	0.005		0.193	0.021	
Mercaptan sulfur, wt. %	0.015	0.002		0.017	0.001		0.058	0.001		0.024	0.003		0.024	0.002	
Reid vapor pressure	8.4	8.4		8.4	9.3		7.1	6.9		12.4	11.6		6.3	6.5	
Gravity, °A.P.I.	63.9	63.3		64.9	65.5		56.3	56.3		68.3	67.7		57.4	57.3	
Distillation, °F.:															
First drop	92	98		93	97		104	103		92	92		100	105	
5% evaporated	116	126		119	122		138	137		96	105				
10% evaporated	144	152		145	147		161	160		127	133		170	173	
20% evaporated	177	184		175	177		190	188		157	162		202	204	
50% evaporated	241	243		231	230		243	242		220	223		269	265	
70% evaporated	272	275		257	258		277	276		251	254		...	...	
90% evaporated	306	312		294	294		326	323		291	295		...	...	
95% evaporated	321	326		313	311		346	342		303	311		351	351	
End point	357	371		361	361		380	381		346	355		408	408	
Recovery, %	97.2	97.5		97.1	97.0		98.0	98.0		95.0	96.0		98.0	98.0	
Residue, %	0.4	0.5		0.7	0.6		0.5	0.6		0.3	0.3		1.0	1.0	
Loss, %	2.4	2.0		2.2	2.4		1.5	1.4		4.7	3.7		1.0	1.0	

ering the end point of the desulfurized base. This phase of desulfurization was covered rather completely by Guthrie and Simmons.[8] The application of this procedure with modifications will enable many refiners to produce premium-grade fuels of increasing octane specifications.

Straightrun Gasoline Desulfurization

Some specific examples of commercial-plant desulfurization on straightrun gasolines are of interest in that they illustrate normal operating conditions and results. Data on stocks from a variety of crudes are given in Table 1. The desulfurized products reported in this table are all used in motor-fuel blends. During the war the units designated as "Plant C" and "Plant E" produced 91-octane aviation fuel regularly from a selected fraction of desulfurized straightrun gasoline.

Of particular interest to many refiners is the decided advantage of desulfurization prior to thermal reforming of sulfur-bearing naphthas. A recent study was completed in a semicommercial unit in which a 250°-410° F. boiling range naphtha from West Texas pipe line crude was desulfurized with the results shown in Table 2. Both the raw and desulfurized naphthas were then thermally reformed on the semicommercial unit at three destruction levels each. These data are reported in Table 2, while the octane-yield relationships with various increments of tetraethyl lead are shown graphically in Fig. 1. Companion tests 1 and 1-A, 2 and 2-A, and 3 and 3-A were made on the raw and desulfurized naphthas, respectively, under identical conditions of charge rate, pressure, and temperature. It is interesting to note that there is a difference in depth of destruction of the order of 3-4 per cent for equivalent time-temperature conditions. These variations in yields are reflected in the yield-octane relation-

(Continued on page 115)

TABLE 3—COMMERCIAL PLANT—PERCO CATALYTIC DESULFURIZATION
(Cracked-Straightrun Blend)

Unit designation, capacity—	Plant "F," 400 B/D*				
Crude source—	Michigan				
		Desulfurization			
Inspection data:	Before	After	Gain	After	Gain
A.S.T.M. octane, clear	58.6	63.9	5.3	63.2	4.6
Plus 1.0 ml. TEL/gal.	66.4	73.9	7.5	72.7	6.3
Plus 3.0 ml. TEL/gal.	73.1	79.0	5.9	78.9	5.8
Research octane, clear	61.4	67.2	5.8	66.2	4.8
Plus 1.0 ml. TEL/gal.	70.0	76.6	6.6	75.3	5.3
Plus 3.0 ml. TEL/gal.	77.9	83.7	5.8	82.9	5.0
Total sulfur, wt. %	0.088	0.024		0.023	
Mercaptan sulfur, wt. %	0.023	Swt.		0.001	
Reid vapor pressure	9.9	10.0		12.1	
Gravity, °A.P.I.	66.2	65.9		67.7	
Distillation, °F.:					
First drop	94	91		88	
5% evaporated	113	101		99	
10% evaporated	128	120		116	
20% evaporated	152	146		142	
50% evaporated	212	210		207	
70% evaporated	248	247		243	
90% evaporated	295	296		293	
95% evaporated	320	320		317	
End point	355	385		356	
Recovery, %	97.5	96.0		96.5	
Residue, %	0.5	0.8		0.4	
Loss, %	2.0	3.2		3.1	
Operating conditions:					
Charge rate, bbl. per hour		15		17	
Barrels treated per ton		55		930	
Temperatures, °F.:					
Furnace outlet		732		798	
Reactor outlet		725		788	
Pressure, psig.:					
Furnace outlet		42		38	
Reactor outlet		23		20	

*Charge is 2 per cent poly, 48 per cent cracked, and 50 per cent straightrun.

TABLE 2—SEMICOMMERCIAL DESULFURIZATION AND THERMAL REFORMING OF WEST TEXAS PIPE-LINE NAPHTHA BEFORE AND AFTER CATALYTIC DESULFURIZATION

Type of operation—	Desulfurization		Thermal reforming					
Reforming companion tests—			One		Two		Three	
Charge stock, thermal reforming—			Raw	Desulf.	Raw	Desulf.	Raw	Desulf.
Yields:								
Fixed gas, C_2, lighter, wt. %	(*)	(†)	12.23	10.22	8.08	6.48	16.35	15.46
Butanes-butylenes, vol. %	(*)	(†)	7.51	6.28	5.27	5.03	9.89	8.08
Pentanes-pentenes, vol. %	(*)	(†)	7.49	5.05	4.48	4.07	8.05	5.30
C_6, 400° F. gasoline, vol. %	(*)	(†)	73.10	78.22	81.77	84.35	63.22	69.47
Residuum, vol. %	(*)	(†)	2.79	2.23	2.77	1.89	4.90	3.50
Inspection C_6, 400° F. gasoline:								
A.S.T.M. octane, clear	42.4	47.2	68.0	66.6	64.4	62.3	75.3	72.4
Plus 1.5 ml. TEL/gal.	52.3	61.5	75.9	76.4	73.0	73.5	80.6	79.7
Plus 3.0 ml. TEL/gal.	57.3	68.0	79.0	80.4	76.7	78.0	82.5	82.7
Research octane, clear	43.9	48.1	76.9	74.8	70.5	68.2	87.3	82.7
Plus 1.5 ml. TEL/gal.	54.2	63.0	85.2	84.2	80.7	79.0	92.6	90.4
Plus 3.0 ml. TEL/gal.	61.3	72.0	88.2	87.8	84.4	83.0	94.1	93.0
Total sulfur, wt. %	0.183	0.017	0.065	0.016	0.064	0.019	0.056	0.017
Mercaptan sulfur, wt. %	0.059	0.0012	0.011	0.0014	0.011	0.0013	0.009	0.0012
Bromine number	...	2	34	26	27	17	45	33
Reid vapor pressure	0.6	1.4	5.1	4.1	4.4	2.8	5.1	3.9
Gravity, °A.P.I.	48.7	49.6	49.9	49.8	50.1	50.0	48.2	49.1
Distillation, °F.:								
First drop	243	218	112	110	118	122	118	119
5% evaporated	268	262	168	169	177	204	162	169
10% evaporated	275	272	199	210	212	232	187	195
20% evaporated	284	282	233	245	243	258	220	230
50% evaporated	311	311	285	290	293	293	278	285
70% evaporated	335	336	312	316	321	321	309	314
90% evaporated	369	375	354	358	361	360	356	358
95% evaporated	385	400	377	379	384	379	380	382
End point	414	422	397	402	402	400	400	401
Recovery, %	98.6	98.0	98.0	98.1	98.0	98.5	98.0	98.0
Residue, %	1.0	1.0	1.1	1.3	1.2	1.1	1.0	1.0
Loss, %	0.4	1.0	0.9	0.6	0.8	0.4	1.0	1.0
Destruction, wt. %	...	..	21.23	17.67	15.20	12.45	29.96	25.94

*Naphtha charge. †Desulfurized naphtha.

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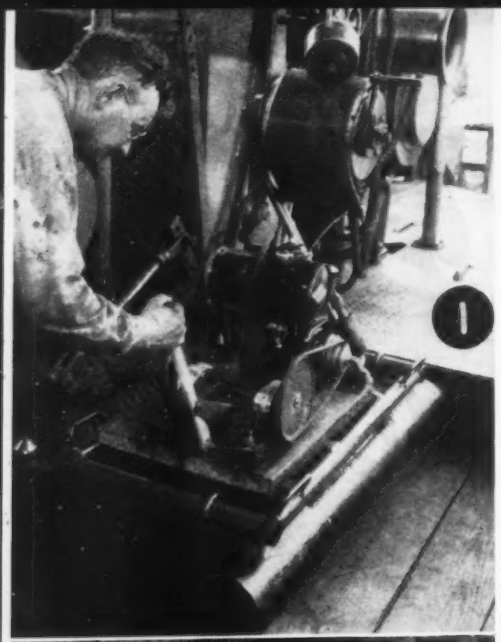
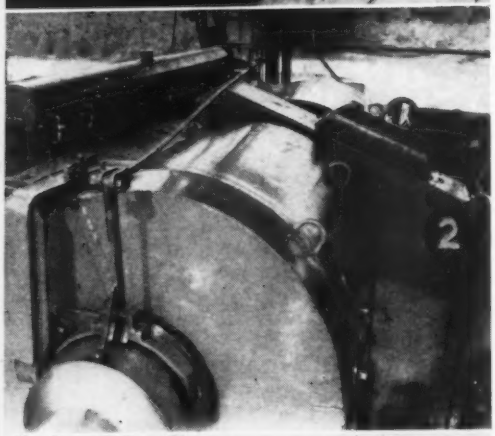
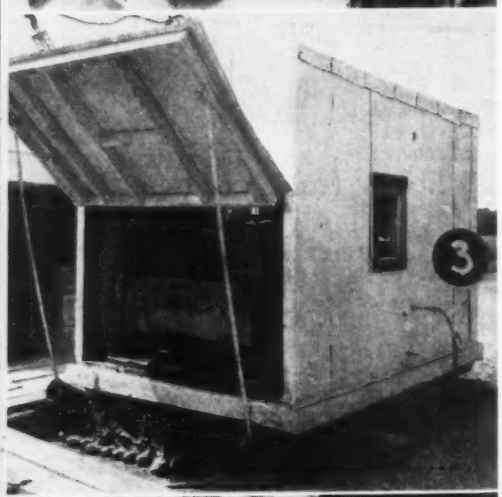
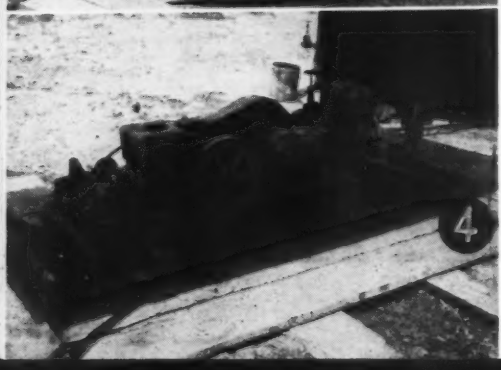








INGENUITY often displayed by crew members in devising special facilities to expedite their work and aid in the assembly and operation of drilling rigs is demonstrated in the accessories and hookups provided on a rig owned by Ed Moran, drilling contractor, in the Griffin field, Gibson County, Indiana.

Some of these "operating ideas" are shown in the accompanying pictures. Several are improvisions to give modern advantages and features to old-style but still serviceable · equipment. Others were designed to add to the unitization and portability. Still others represent adaptations of certain equipment to special uses.

The rig, one of the largest and most complete in the Illinois basin, has been at Griffin since before the field was opened in 1938, and previously had been operated in other parts of the district and in other areas. Sóme of the original equipment still is on the rig, and some of the crew, including L. R. Ross, have been with it almost from the beginning, and have taken a personal interest in maintaining it and adding new features, and modernizing it.

1—Engine on Hand Measuring Reel

A 1½-HP. gasoline engine power unit has been designed by Ross (in picture) for driving hard-type measuring-line reel. Power shaft is fitted with a three-groove pulley to permit varying the speed ratios to the reel. The power and drive pulleys to the reel are affixed to opposite ends of a drive shaft, set in two bushing block slides, which in turn are mounted and held on two parallel tracks constructed of angle iron. The drive shaft can slide forward or backward on the tracks to tighten or release the drive belt from the engine pulley, and thus permit engagement or disengagement of the drive to the measuring line. The sliding drive via the hand lever can be set at any desired tension. The skid frame is constructed of 2-in. tubular material. Four handles are welded to the frame at each corner.

2—Lubricator Fitted on Old Draw Works

MODERN draw-works transmissions incorporate means for continuous self lubrication of chains and sprockets but at the time this draw works was obtained such facilities were not included and it required periodical oiling of the chains and sprockets by hand.

To insure the chains be adequately lubricated at all times, a continuous lubricating-oil feed was devised. The oil reservoir mounted across the width of the top of draw works was fabricated from 8⅝-in. pipe. A strip of welded steel plate serves as a flat bottom to give solid mounting. A short 2-in. nipple with removable top was welded on the top side for filling with oil. Outlets for the ¼-in. copper tubing oil-feed lines, extending through the top of the transmission housing to the different chains, are located along the lower back side of the reservoir. Each outlet fitting is provided with a small pet cock and in the lines are small sight glasses so that crew members can see at a glance if the oil is feeding properly.

3—Electric Unit in Portable House

THE auxiliary electric power generator unit is installed in a small skid-mounted house of corrugated-iron construction. The generator is driven by a multicylinder gas engine; the gas-volume-tank and fuel-line connections are installed semipermanently in the house and remain in place during moves. To operate the unit it is only necessary to attach a low-pressure hose line from the rig fuel system to the outside connection shown at the side of the house, and plug in the wiring from the rig at the socket in the top of the house. With the generator unit at the front end, there is ample space in the rear of the house for use of the crews to change clothes. Lower half of the front end hangs on hinges and opens upward to provide increased ventilation. The two supporting arms slide back into the house when the front is closed.

4—Water Pumping Unit

HERE the one-cylinder gas engine operating the pump has been adapted to the use of either gas or gasoline for fuel. The horizontal tank at the front end of the skid serves either as a gas volume or gasoline tank. It was fabricated from a 2-ft. section of 4-in. pipe and is provided with both an inlet connection for the gas fuel line and a filler cap for gasoline. Gas feed to the engine is through a small pressure-reducing regulator on the tank. Gasoline feed from the tank to the carburetor is controlled by a diaphragm-type pulsating regulator operated off the engine vacuum. Fuel injection to the ⅛-in. carburetor inlet is through a ¾-in. T nipple for air mixture. To operate on gas it is necessary only to close the small valve in the gasoline feed line or cut off the vacuum to the pulsating regulator and open the valve in the gas inlet to the volume tank. To operate with gasoline the procedure is reversed.

INGENIOUS IDEAS EMPLOYED TO KEEP OLDER RIG OPERATING AT MAXIMUM EFFICIENCY

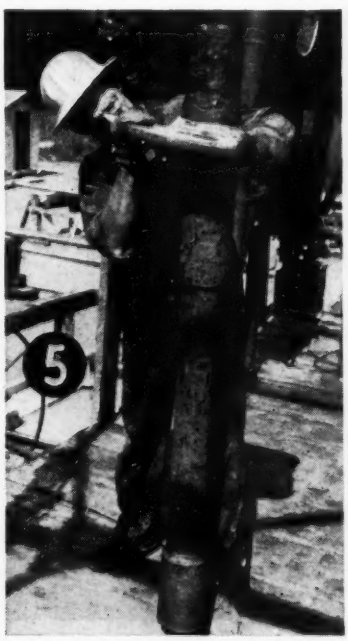
by Neil Williams

5—Mounting Pipe Wipers

HERE John Fulton, one of the crew members, demonstrates a simple device improvised for slipping a drill pipe wiper over the tool joint end. Since the wiper is designed to fit snugly on the drill pipe, the center opening is somewhat smaller than the diameter of the tool joint and must be stretched to slip it over. The device was made from a conically shaped block of wood with the larger end rounded to the same diameter as that of the tool joints. Thread end of the pin part of an old tool joint was cut off about an inch back of the shoulder and affixed securely to the larger end of the conical block. To install a wiper on a joint of drill pipe, the device is screwed into the box end of the tool joint and the wiper then can be pulled down over the conical block onto the tool joint.

6—Guards Are Hinged for Portability

GUARDS for the V-belt drives of the engine compound and to the power input shaft of the draw-works transmission are designed to minimize the amount of dismantling that must be done during moves. Each of the two main guards shown is in three hinged sections. In the case of the guard over the main drive from the No. 1 engine to the draw-works transmission, the middle section between the engine skid unit and the transmission shaft and master clutch unit (foreground) is hinged at the top to the front section. For moves, this section raises up and folds back on top the first section, and is carried with the transmission shaft and clutch unit. The front section is hinged along its bottom front edge to the skid frame so that it, with the hinged middle section can be folded back to remove the V belts from the shaft pulley if necessary. The rear section, which is moved as a part of the skid unit, is hinged at its back edge to that skid frame so it also can be lifted to provide access to the drive pulley. Bottom edges of the sides of the guards are held in place when in use by guide bars on the inside members of the two skids. The front section also is provided with a hinged door on the side to provide access to the pulley. The guard over the compounding V-belt drive between the two engine units is similarly constructed. In this case, the middle section is hinged at the top to the section on the No. 2 engine unit and is folded back onto and moved with that unit.

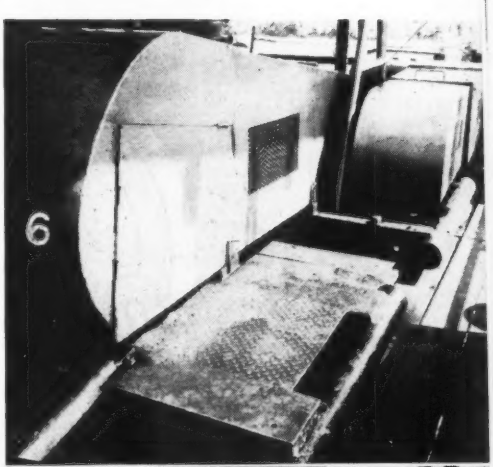


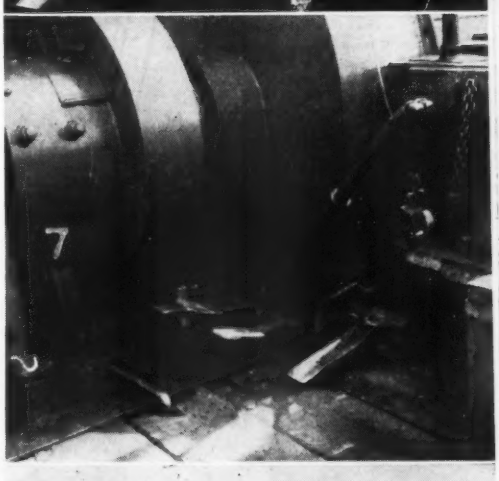
7—Pedal Control for Cathead

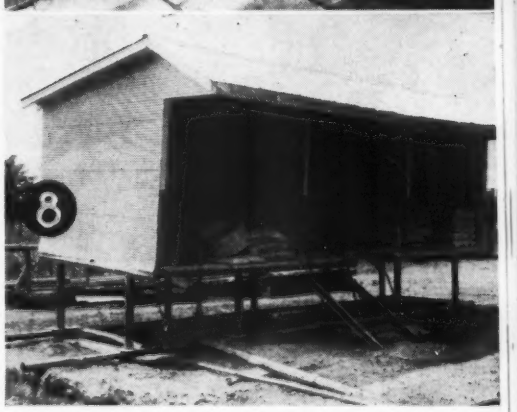
THE supporting structure and base on which the house is moved as an integral unit was fabricated from discarded tubular material. Floor of the house is elevated to simplify unloading of mud supplies from trucks. Permanent connections are provided in the left front corner of the house for a mud mixing hopper.

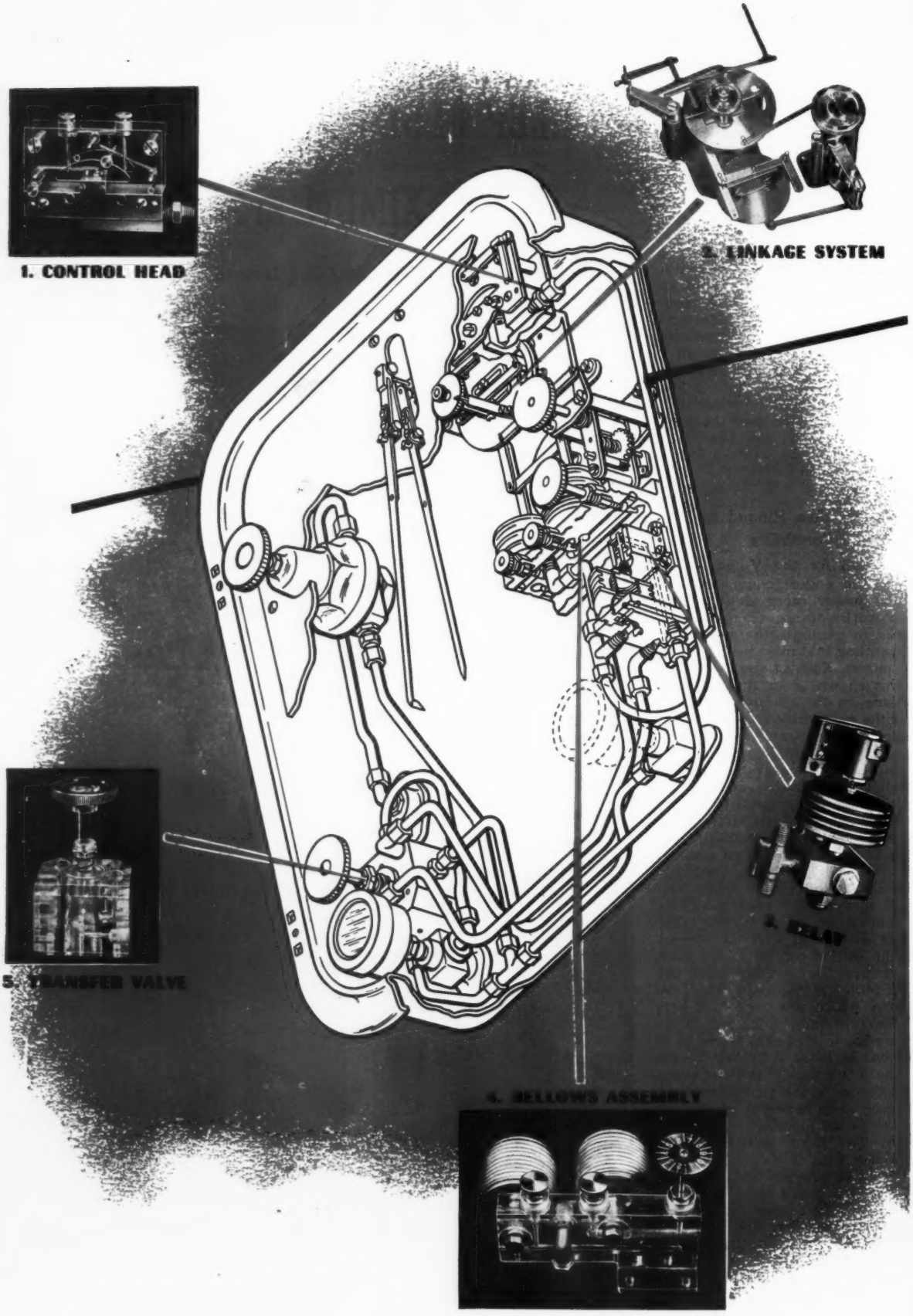
8—Portable Mud House

A FOOT-PEDAL control for the cathead clutch also was devised. The pedal (at right on floor below brake handle) is mechanically linked with the cathead clutch through a system of levers. By its use, the driller's hand normally required to manipulate the cathead hand lever control is free to operate the brake, clutches, or engine throttles, a particular advantage when making up or breaking out pipe on trips.





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Fat-Oil Deethanization

by A. M. Whistler

IN an absorption plant, fat oil leaves the bottom of the absorber with considerable amounts of methane and ethane. The absorption of these two gases is not from choice. Far better, could they be excluded in the absorption process. They are not wanted as products. And worst of all, further on they give trouble in separating out the desirable fractions.

Several methods have been used to rid the fat oil of all, or even a part, of these two constituents. The commonest method is so-called flashing into a drum at lower pressure. This is really a one-step fractionation. It is very useful. But it has the disadvantage of every single-step fractionation. This disadvantage is poor separation.

About 15 years ago the so-called fractionating absorbers were tried. Two or three trays were added below the gas inlet of the absorber. A small steam coil was inserted into the fat oil at the bottom. No real gain resulted. Reboiling was too small for any substantial removal of methane and ethane.

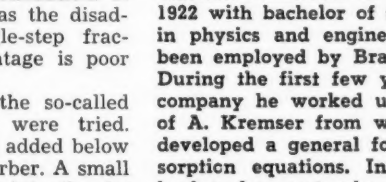
Several years ago, propylene became quite valuable in certain petroleum-chemical plants. One of the large oil companies built an absorption plant for high recovery of propylene. It built a fat-oil fractionator for removal of all the methane. About half the ethane was removed also, without undue loss of propylene. All this was based on very careful paper work before construction.

During the preliminary process work on a plant built about a year ago, the question was voiced: "Can the ethane also be substantially removed from fat oil without too much loss of propane?" The answer required a lot of tiresome paper work. But the paper work showed the idea to be practical.

Guarantees quoted were as follows: Propane retention, 70 to 80 per cent of that absorbed in the main absorber; propane purity 90 to 95 mol per cent. Offhand, there seems no point in quoting a range. The lower figures of 70 per cent retention and 90 per cent purity are all that had to be met. But the higher figures were useful. They indicated what the plant would probably do.

Fig. 1 is a simple picture of the flow. The main absorber operates like all absorbers. In it, over 95 per cent of the total butanes are absorbed, and over 60 per cent of the propane. The fat oil then goes to the middle of the deethanizer. Think of the fat-oil deethanizer as a fractionator. It has reflux. And it has reboil. The unusual feature is that the reflux is lean oil, not condensed overhead.

Fig. 2 shows the reboiler hookup. The liquid section in the bottom is divided into two compartments. Fat oil drops from the bottom tray into the left-hand side. It is then pumped



A. M. Whistler is process consultant for C. F. Braun & Co., Los Angeles. He presented this paper, which explains the capabilities and limitations of fat-oil deethanization, before the annual fall meeting of the California Natural Gasoline Association in Los Angeles October 11. Whistler graduated from California Institute of Technology in 1922 with bachelor of science degree in physics and engineering. He has been employed by Braun since 1926. During the first few years with the company he worked under direction of A. Kremser from whose notes he developed a general formula for absorption equations. In recent years he has done extensive work in fractionation of isobutane and isopentane and in design of superfractionators for production of high-octane cuts from straightrun stocks.

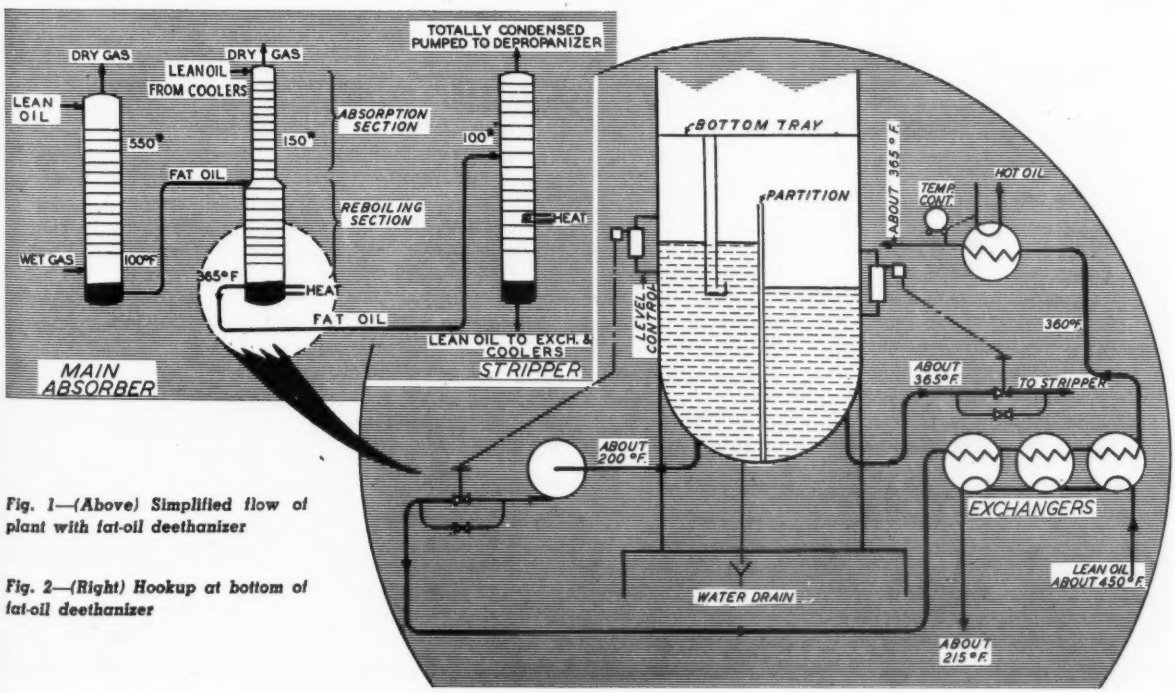


Fig. 1—(Above) Simplified flow of plant with fat-oil deethanizer

Fig. 2—(Right) Hookup at bottom of fat-oil deethanizer

through exchangers and into the right-hand side.

An important feature is the difference in temperature between the two compartments, the first section is some 200° as against 365° F. in the final section. These temperatures allow the use of countercurrent heat exchange with the hot lean oil. The only direct heat used for reboiling the deethanizer is a small amount for hour-to-hour control of the final temperature.

Now for actual results. Fig. 3 gives averages of temperatures, pressures, and flows for one acceptance test. Table 1 details the plant balance for the same test. Gas streams entering and leaving the plant are given at the top of Table 1. From these, balances on methane and ethane can be made, since none of these two go on with the liquid products. Accuracy of this balance is shown under the "Material Balance."

Butanes and pentanes are balanced in two ways, under the heading "Recoveries." One way is by comparing gas-in and gas-out. The other is by comparing "product in tanks" with "gas-in." The two methods check fairly well. Unfortunately, the liquid meter on propane failed. The volume could not be measured. Depropanizer overhead is obtained by subtracting bottoms and dry gases from wet gas. This is for C_3 plus only.

Initial operating conditions were set to closely follow those computed. It was almost 3 weeks later that the first test results were obtained. The results were a little surprising, especially in the propane purity of some 99.5 per cent.

A second test practically duplicated the first except that ethane in the propane was practically nil. Propane production also was some 2,000 gal. per day greater. The third test was a "quickie." Ethane in propane increased to a little over 1 liquid volume per cent while recovery of propane went up to 78 per cent of that absorbed. Later tests gave about the same results. There was, at that time, no point in trying for increased propane of lower purity. First, the propane tanks were not ready, and second, time was not available for experimentation.

One natural question is: "What are the limits of the fat-oil deethanizer?" This is too big an order to cover all possible conditions. But some ideas can be given as to limits. The important point to keep in mind is the final bottom temperature. This is determined by two conditions: (1) Pressure, (2) amounts of propane and butanes in the bottoms. Thus, lean gases are not so good for fat-oil deethanizing. The wet gas given in Table 1 is not far from the limit. Pressure depends finally upon propanes and butanes, once the temperature is set. For conditions of Fig. 3 and Table 1, 150 psig. in the deethanizer is not far from the limit. To sum up, the natural field of the fat-oil deethanizer is for gases that are at least as rich as, or richer than, the wet gas of Table 1.

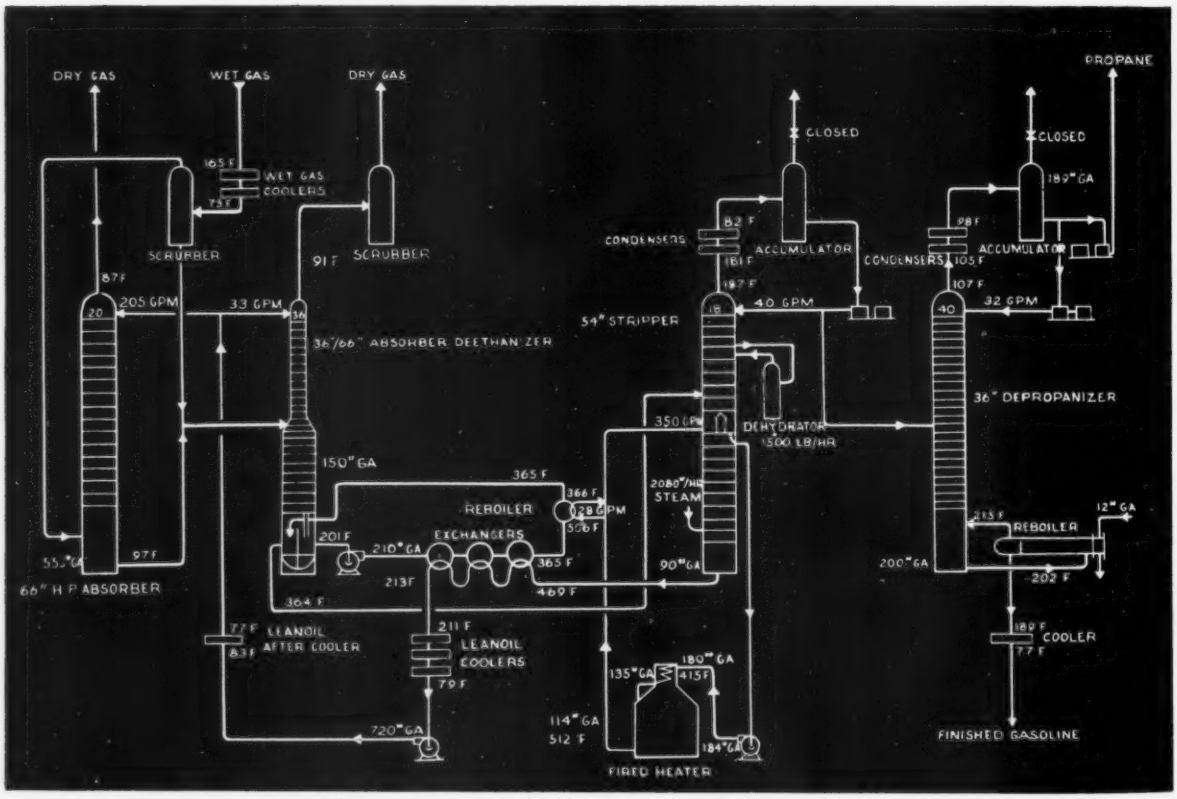
Another point is heat recovery. This depends chiefly upon the bottom-tray temperature. In our test conditions this is about 200° F. (Fig. 3). The final temperature is 365° F. or a rise of 150° F. As the richness of the gas changes, the big change is in the final temperature. The bottom tray does not change anywhere near as much.

Another natural question is: "Can fractionation be improved?" With respect to separating ethane from propane, the answer is yes, but not much. More oil would be put over the top of the deethanizer. And the final bottom temperature would be raised. This is, in effect, increasing the reflux.

To help find the proper niche for a fat-oil deethanizer, absorption plants may be divided into three main groups. First, where from 50 to 90 per cent of propane, or more probably propylene, is recovered. The second, where propane can be readily marketed. But propane is still not worth expensive plants. Oil rates are set by butane recovery. Third, where propane cannot be sold as a product.

The fat-oil deethanizer does not fit the first case. Too much propane is

Fig. 3—Plant A acceptance test



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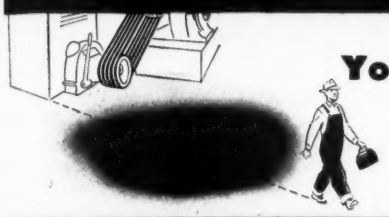

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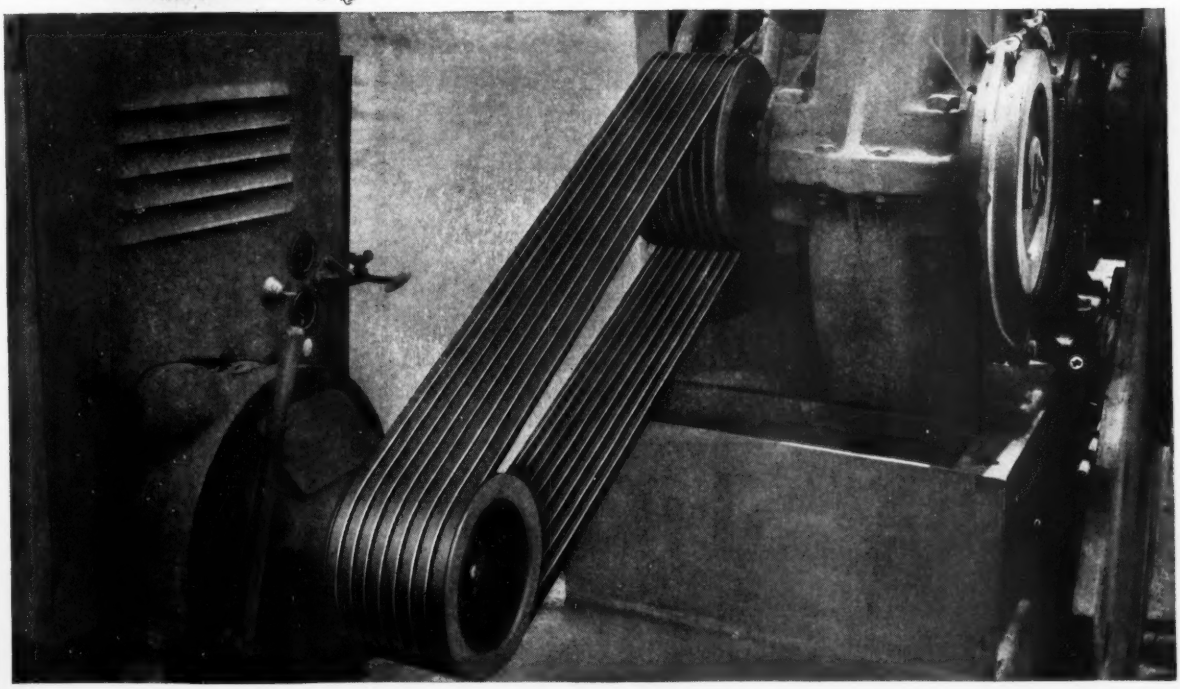

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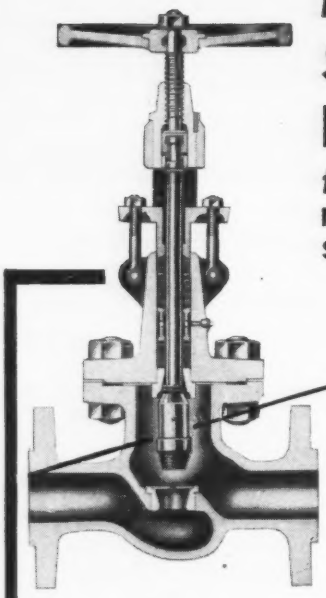

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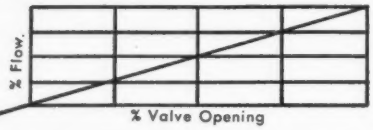

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still lost. And it does not fit the third case because of extra operating expense in fuel. It does appear to have a field in the second case, as the following analysis will show.

To make comparisons, the unit shown in Fig. 4 is chosen. Call this Unit B, and the unit with the fat-oil deethanizer of Fig. 1, call Unit A. Unit B is a very common hookup. The reabsorber, or equal, must be included for vents from both flash drum and stripper accumulator to prevent loss of butanes. A single still is used at 150 psig. A gasoline deethanizer is included, partly to hold propane, and partly to prevent undue ethane contamination.

Production of propane for the two plants is shown in Table 2. Plant B has practically reached its limit in propane recovery. More butane and heavier is needed to hold the propane as liquid in the stripper accumulator. Increased oil over the reabsorber sends more propane to the stripper. But the additional propane simply returns as vapor to the reabsorber.

TABLE 2

Propane—	Unit A	Unit B
Gallons per day .. (Approx.)	12,000	7,100
Net gain ..... (Approx.)	5,000	....

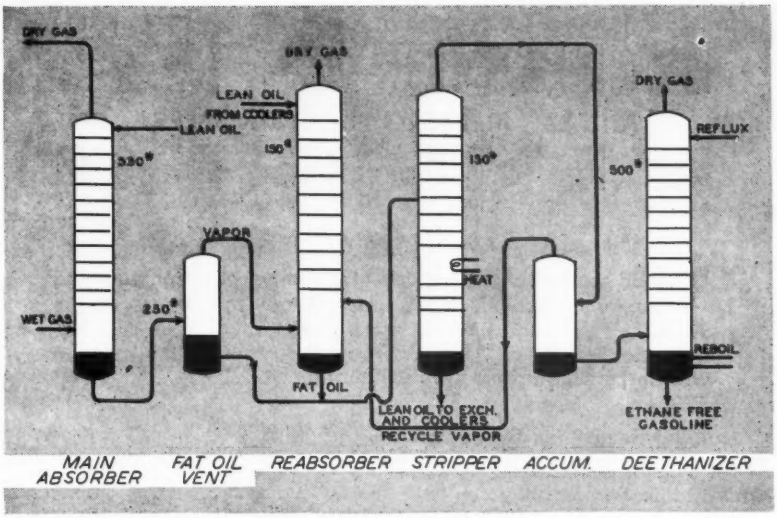

Fig. 4—Plant B flow diagram

Plant A returns about $52,000 yearly more than Unit B. This is gross return, of course. To find net return, one must find first costs and operating costs. In the operating costs, let us set 10 cents per million B.t.u. for fuel. And to be fair, we should deduct from the propane returns its value as gas fuel at the plant boundary.

(Continued on page 125)

TABLE 1—PLANT BALANCE ON ACCEPTANCE TEST FOR PLANT A

VAPOR STREAMS

	Wet gas to plant				Dry gas from absorber				Per cent recovery in main absorber	Dry gas from deethanizer			
	Mol. %	Gal./ M.s.c.f.	M.s.c.f./ 24 hr.	Gal./ 24 hr.	Mol. %	Gal./ M.s.c.f.	M.s.c.f./ 24 hr.	Gal./ 24 hr.		Mol. %	Gal./ M.s.c.f.	M.s.c.f./ 24 hr.	Gal./ 24 hr.
CO_2	0.60	....	119	....	0.60	....	100	....	....	1.00	....	13	....
H_2O	..	....	....	....	..	....	..	....	....	0.42	....	6	....
C_1	82.81	....	16,376	....	89.17	....	14,800	....	....	56.60	....	759	....
C_2	8.92	....	1,766	....	7.89	....	1,311	....	....	30.05	....	403	....
C_3	4.92	1.350	974	26,680	2.26	0.620	375	10,300	61.5	11.51	3.159	154	4,230
i-C_4	0.68	0.222	135	4,395	0.03	0.010	5	166	96.1	0.30	0.100	4	134
n-C_4	1.20	0.378	248	7,480	0.03	0.010	5	166	97.8	0.10	0.032	1	43
i-C_5	0.26	0.095	51	1,880	0.02	0.009	4	149		0.02	0.010	....	13
n-C_5	0.20	0.072	40	1,425	...	...	....	....	97.9	....	....	....	....
C_{6+}	0.41	0.189	81	3,740	....	....	....	....		....	....	....	....
	100.00	2.306	19,790	45,600	100.00	0.649	16,600	10,781		100.00	3.301	1,340	4,420

LIQUID STREAMS

	Depropanizer overhead			Depropanizer bottoms		
	Mol. %	Liq. %	Gal./24 hr.	Mol. %	Liq. %	Gal./24 hr.
C_1	Trace	Trace	....	....	....	....
C_2	0.30	0.26	31	..	....	....
C_3	99.52	99.52	11,842	1.9	1.52	280
i-C_4	0.18	0.22	26	23.3	22.38	4,140
n-C_4	...	...	....	42.2	38.94	7,200
C_{5+}	...	...	....	32.6	37.16	6,880
	100.00	100.00	*11,899	100.0	100.00	†18,500

MATERIAL BALANCE

	Total outlet streams		
	M.s.c.f./ 24 hr.	Gal./ 24 hr.	Outlet/ wet gas
C_1	15,559	....	0.951
C_2	1,714	....	0.971
C_3	.....	26,652	0.999
i-C_4	.....	4,466	1.016
n-C_4	.....	7,409	0.991
C_{5+}	.....	7,042	1.000

*Wet gas less absorber dry gas, deethanizer dry gas, and depropanizer bottoms.
†Based on production from 1 p.m. to 3 p.m.

RECOVERIES

	Propane	Butanes	Pentanes plus
Based on wet gas less losses	Absorbed, gal./24 hr. .... 16,380 Losses: C_2 overhead ....4,230 C_4 bottoms ..... 280 4,510 Per cent loss ..... 27.6 Per cent recovery 72.4	Wet gas, gal./24 hr. .... 11,875 Losses: C_1 dry gas ..... 332 C_2 dry gas ..... 177 C_4 overhead ... 26 535 Per cent loss ..... 4.5 Per cent recovery *95.5	Wet gas, gal./24 hr. .... 7,045 Losses: C_1 overhead .... 149 C_2 overhead .... 13 162 Per cent loss ..... 2.3 Per cent recovery 97.7
Based on liquid products		Wet gas, gal./hr. ..... 11,875 Production ..... 11,340 Per cent recovery ..... †95.6	Wet gas, gal./24 hr. .... 7,045 Production ..... 6,880 Per cent recovery 97.7
Contract	Depropanizer overhead to contain not less than 70% of the propane absorbed in the main absorber. Overhead to be not less than 90% pure propane.	Depropanizer bottoms to contain not less than 95% of the total butanes in the wet gas.	Not specified.

*i-C_4 93.2, n-C_4 97.2. †i-C_4 94.2, n-C_4 96.3.

DIGESTS

A.I.M.E. MEETING, LOS ANGELES

THESE are "highlight" digests of a number of the engineering papers presented at the Los Angeles meeting of the A.I.M.E. Petroleum Division held October 24-25 at the Ambassador Hotel, Los Angeles. A further report of the meeting will be carried in next week's Journal.

Calculated Recoveries by Cycling From a Retrograde Reservoir Of Variable Permeability

M. B. STANDING, E. N. LINDBLAD, R. L. PARSONS, Standard Oil Co. of California, La Habra, Calif.

HEART of this study is that the recovery of the heavier components from a gas cap or retrograde pool is shown to be the greatest when the sand is cycled with a dry gas at a low pressure. This conclusion is in direct opposition to the belief that the most efficient production program is pressure maintenance and cycling at or near the dew point.

The results are calculated from (a) constant volume, variable composition P.V.T. tests on a mixture of trap gas and liquid from a producing well; (b) published equilibrium-constant data, and the measured composition of the dew point material; and (c) the fact that in a sand section of homogeneous permeability, injected gas displaces reservoir gas nearly quantitatively.

The results are based on the simplifying assumption that variable-permeability systems may be defined by the ratio of two statistical parameters, and that gas injected into an actual sand will behave as though the sand were composed of many layers, each of constant permeability.

In gas-condensate-type reservoirs pressure decline is accompanied by the formation of a liquid phase throughout the reservoir. Over the past 10 years the processing of the material from these types of reservoirs for the heavier hydrocarbon components and the return of the light fractions to the reservoir ("cycling") has become increasingly popular. It has often been stated that the purpose of such a program is to prevent the loss of the retrograde liquid phase formed in the reservoir.

As to cycling, this paper presents the results of laboratory tests and computations concerned with several possible methods of producing a gas cap or condensate type of reservoir. The results show that the recovery of heavier hydrocarbons from this type of reservoir is not a maximum under conditions of cycling at or near the dew-point pressure. Instead, variations in permeability and the ability of the dry injected gas to revaporize condensate, point to cycling at a considerably reduced pressure as the optimum production method. In addition, a procedure is suggested for evaluating sands for their permeability variation.

The calculations are in terms of the production of the butanes and heavier fraction from the gas cap of a field which had an original pressure of approximately 3,000 psi. Specifically, the calculations show:

1. To what extent the condensate formed in the reservoir after pressure decline can be recovered by the cycling of a dry absorber plant gas through the sands.

2. Whether there would be greater recovery of hydrocarbons if cycling were instigated at the original reservoir pressure.

In answering the above points, three factors determined the efficiency with which condensate is recovered from a sand. These factors are:

1. The ability of the dry absorber gas to vaporize the condensate in the sand.

2. The effect of bypassing, within a swept-out area, due to permeability variations in the sand.

3. The effect of well pattern on the volume of formation swept out by the injected gas.

Compositional and volumetric changes of reservoir gas and liquid phases during pressure decline and cycling can be calculated from equilibrium-constant data and the original composition of the reservoir material. However, in the case of condensate systems, the quantities of liquid phase so calculated are so intimately connected with the equilibrium constant of the heaviest components in the system, it is desirable to have the results of P.V.T. and other tests to guide the calculations.

With respect to the effect of bypassing, on a local scale, due to permeability variations, the actual variations are so complex and so largely unknown that attempts are not made to refine the calculating procedure unduly, or to consider whether the flow should be radial or linear or some more complicated form. Rather, the calculations are based on the simple supposition that the flow is linear through variable permeabilities in parallel.

While this paper shows only calculated results, a number of drawdown and cycling tests were conducted in a tube packed with unconsolidated sand originally containing dew point material. The results of these tests verified the calculated results.

Some Aspects of High Pressures In the D-7 Zone of the Ventura Avenue Field

E. V. WATTS, General Petroleum Corp., Los Angeles.

THE D-7 zone of the Ventura Avenue field is of special interest because the initial reservoir pressure nearly equaled the pressure exerted by the overburden. Long considered a "high-pressure" field, the original reservoir pressure in the D-7 zone is estimated to have been 8,300 psi. at 9,200 ft. While the phenomenon has been observed elsewhere, there is no previous case in California on record.

Such high pressures have been attributed to sealing of the reservoir, followed either by emergence of the beds or by compaction of the sediments in various ways.

Oil in the D-7 zone is undersaturated. At pressures above the bubble point, oil is recovered by the slight expansibility of the reservoir framework and its liquid contents.

The bubble-point pressure in the D-7 zone is estimated to be 3,500 psi. Between the initial pressure and the bubble point, oil can be recovered only by virtue of the slight expansibility of the reservoir and its liquid contents. Contrary to general opinion, this phase of the recovery process is a significant portion of the total. If the experience in the older zones is any criterion, the D-7 may ultimately be depleted to a gas saturation of about 22 per cent. Using 17 per cent porosity, 40 per cent interstitial water, 1.45 bubble-point formation volume factor, and 1.15 final formation volume factor, the gas expansion recovery is calculated to be 110 bbl. of tank oil per acre-foot of productive sand.

However, it is calculated that recovery above the bubble point, due to the net volume change of the reservoir and the contained liquids, amounts to 13.5 bbl. of reservoir fluid per acre-foot per 1,000 psi. change in pressure. At an average formation volume factor of 1.42, the drop in mean formation pressure from 8,500 psi. to the bubble point of 3,500 psi. would therefore be accompanied by the production of about 47 bbl. of tank oil per acre-foot.

Expressed another way, the excessive pressure should result in an ultimate acre-footage recovery 40 per cent greater than that of a similar field having only normal initial pressure.

Hydraulic Drives in the Oil Fields

NICHOLAS A. D'ARCY, JR., Charles W. Carter Co., Los Angeles.

HYDRAULIC drives can be classed into three general groups, as used in the oil industry today: (1) Hydraulic couplings are essentially used where the output speed and torque requirements are fairly uniform and the prime mover generally operates at a uniform speed or against the governor. (2) Hydraulic torque converters are used where the speed and torque requirements vary and generally where the prime mover is operated by the throttle. (3) Positive displacement fluid pumps and motors are generally used in relatively small horsepower installations to eliminate complicated shafting and drives. The positive displacement fluid pumps and motors fall into the classification known as "hydrostatic drives" and the torque converters and hydraulic couplings into the classification known as "hydrokinetic drives."

Hydraulic drives have been used successfully in every phase of the oil industry, from geophysical drill rigs to refinery operations, and new uses are constantly being developed for the proper hydraulic installations. It is essential that a thorough engineering analysis be made of each contemplated hydraulic installation in order to insure proper performance.

Geological Interpretation of Radioactivity Well Logs

J. E. KILKENNY, Chanslor-Canfield Midway Oil Co.

RADIOACTIVITY is the spontaneous disintegration of certain elements into other lighter elements with a resultant release of heat and energy.

Radioactivity can be divided into three basic types of atomic disintegration: (1) Alpha rays, (2) beta rays, (3) gamma rays. The alpha rays consist of doubly charged helium atoms discharged from the parent atom. Beta rays consist of nuclear electrons expelled by the parent atom. The gamma ray is an electromagnetic wave given off at the same time as the beta ray. The gamma ray is the most important of the three from the petroleum industry's economic viewpoint.

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(Continued on page 125)

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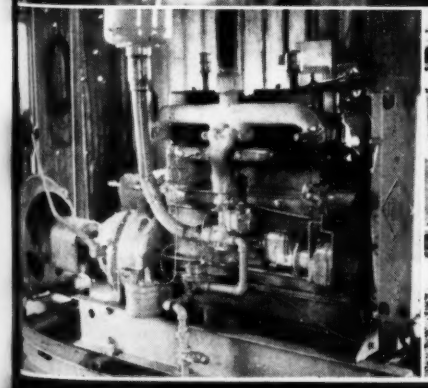

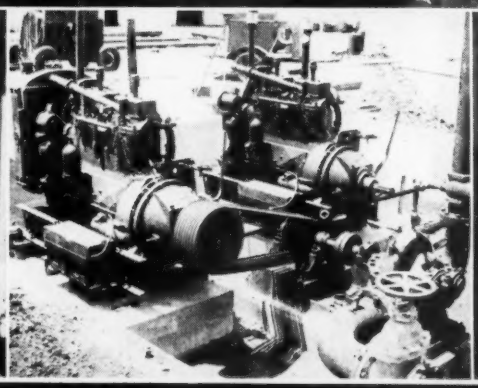

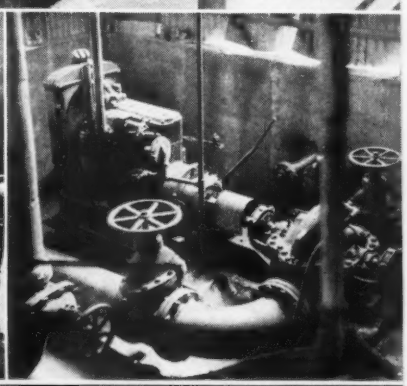

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DIGESTS

A.A.P.G. MEETING, BILOXI

THESE are brief digests of some of the important papers delivered at the A.A.P.G. regional symposium on the southeastern states at Biloxi, Miss., October 24 and 25. Other papers covered the geology of the Gilbertown, Heidelberg, Cranfield, Tinsley, Delhi, and West Tepetate fields; formation of evaporites under marine evaporation conditions; and stratigraphy and geology of Paleozoics in the Black Warrior Basin.

Surface Occurrence of Cretaceous Beds in the Southwestern States

WATSON H. MONROE, Geological Survey, U. S. Department of the Interior, Washington.

THE Cretaceous sedimentary roks of the eastern Gulf region crop out in a crescentic band around the southwestern end of the plunging Appalachian Highlands in a belt 500 miles long and up to 75 miles wide. Their maximum thickness at the outcrop is estimated to be about 2,100 ft.

The oldest beds of the eastern Gulf Coastal Plain, the Vick formation, crop out in a small area in central Alabama. The age of the Vick is uncertain, being post-Paleozoic and pre-Tuscaloosa. It is probably Jurassic or Lower Cretaceous.

Above the Vick formation the Upper Cretaceous formations can be correlated fairly closely with the Texas section, the sequence being divisible into several groups of related formations.

Near the ends of the crescentic belt the sequence of deposition is broken by extensive overlaps. As may be expected, internal, progressive overlap is common in all the formations, but extensive overlap indicating crustal warping is especially notable at the base of each of the larger groups discussed.

Subsurface Occurrence of Cretaceous Sediments of Mississippi

C. W. ALEXANDER, Dixie Geological Service, and R. M. HARRIS, Harris & Payne, Jackson, Miss.

THE Gulf Cretaceous sediments comprise the most significant group of beds as related to the search for petroleum in Mississippi. This paper, and the sections which accompany it, represent a composite of available knowledge of the beds and the consensus on the, as yet, uncertain features of the stratigraphy of the Gulf Cretaceous.

Cenozoic Deposits of Mississippi And Adjacent Areas

GROVER E. MURRAY, JR., Magnolia Petroleum Co., Jackson, Miss.

TWENTY thousand feet or more of Tertiary and Quaternary sediments are present in the central Gulf region of southern United States. They comprise a large, seaward-thickening, wedge-shaped sedimentary complex (Gulf Coast Geosyncline) composed predominantly of deltaic deposits. Thin, relatively uniform and widespread, marine strata are present between the thick deltaic deposits and on the seaward edges of the deltaic masses. These thin, generally distinctive, marine strata are adaptable on the surface to detailed structural mapping; they also serve as key strata in core drilling, in tracing surface units into the subsurface, and in the preparation of subsurface structural maps. Fossils present in the marine units determine their position in the standard geological time scale and assist in determining the relative geographic position at the time of deposition. The thick, ladle-shaped, deltaic deposits are normally unadaptable to structural mapping; however, they are readily used in the construction of areal, facies, and isopachous maps. Landward, both marine and deltaic deposits are replaced by brackish-water and fluviatile sediments; seaward, the marine deposits are progressively of a deeper water environment, the deltaic deposits are progressively more marine.

The Tertiary is represented by four, perhaps five, epochs of deposition, in ascending order, Paleocene, Eocene, Oligocene, Miocene, and Pliocene (?). Each successively younger series of rocks outcrops progressively nearer the present coastline. Similarly, each younger rock series has been downwarped less by the thick, geosynclinal sedimentary load and, therefore, has less southwest regional dip. The Midway (Paleocene), Claiborne (middle Eocene), Jackson (upper Eocene), and Vicksburg (Oligocene) groups each contain important marine units. The Wilcox (lower Eocene), Miocene, and Pliocene (?) are primarily deltaic deposits; they constitute the thickest Cenozoic sedimentary accumulations in the eastern Gulf region.

The outcrop patterns of the major rock divisions of the central Gulf Coastal plain are illustrated by areal geologic maps and stratigraphic sections. The thickness and structural configuration of each division is shown by isopachous and structural contour maps. Representative electrical logs illustrate the electrical pattern of each rock division.

General Geology and Occurrence of Oil in Florida

E. D. PRESSLER, Humble Oil & Refining Co., Tampa.

THE eastern portion of the Gulf of Mexico Basin is divided into provinces on the basis of stratigraphy and subdivided further on the basis of its major structural features. The general area is considered to be a part of the Gulf of Mexico sedimentary basin. The Appalachian Embayment of South Georgia and West Florida has a maximum sedimentary fill of approximately 15,000 ft. of clastic sediments, the South Florida Embayment has a maximum fill of nonclastic sediments approaching 20,000 ft., and the area of the Great Bahama Bank is considered to be underlain by a section in excess of 10,000 ft. Anticlines may be the most prevalent type of structure of both embayments, though faulting is probably present, and conditions are favorable for the formation of stratigraphic traps. Gravity and core drill are the most widely used methods of prospecting, and it is indicated that additional experimental work is necessary to develop proper seismograph technique.

Subsurface Correlations of East Texas, North Louisiana, South Arkansas and Mississippi

ROY T. HAZZARD, Gulf Refining Co., Shreveport.

A SERIES of cross-sections is presented, correlating the Cretaceous beds of East Texas, through North Louisiana and South Arkansas, into Mississippi.

The New Geologic Map of the Tertiary Formations of Georgia

F. STEARNS MacNEIL, Geological Survey, U. S. Department of the Interior, Dothan, Ala.

THE new map of the Tertiary formations of Georgia is exhibited, with a brief discussion of the stratigraphy.

Status of Micropaleontology In the Eastern Gulf Region

HENRY V. HOWE, Louisiana State University, Baton Rouge.

SINCE the paper by Finch in 1824, which initiated the study of the Cretaceous and Tertiary stratigraphy of the eastern Gulf Region, some 200 papers dealing with the microfossils of Mississippi, Tennessee, Alabama, Georgia, Florida, and South Carolina have appeared. Of these, at least 160 deal primarily with foraminifera, 21 with ostracodes, 11 with bryozoa, and 4 with otoliths. In these papers nearly 700 species of foraminifera, 150 species of ostracodes, 580 species of bryozoa, and 23 species of otoliths have been described as new from these states. Hundreds of other species whose type localities lie in other states or countries have been reported. The formations whose type localities have been reasonably thoroughly studied for their microfaunal content are indicated. Some suggestions of needed studies are made. The paper is accompanied by an annotated bibliography which lists the species which have been described as new from this region.

Mesozoic Igneous Rocks of the Northern Gulf Coastal Plain

C. L. MOODY, The Ohio Oil Co., Shreveport.

STUDY of the outcrop areas of igneous intrusions in the Texas, Arkansas, and Georgia portions of the Gulf Coastal Plain furnish clues which simplify interpretation of igneous rocks found in deep-well samples in the Mississippi Embayment. Many of the known centers of later Mesozoic igneous activity, both outcropping and buried, are apparently the sites of ancient volcanoes which furnished to the depositional basins significant amounts of pyroclastic debris now in part preserved in the early and middle Gulf Cretaceous strata. Dikes transect the oldest known sedimentary rocks in the vicinity of the eruptive centers. The oldest igneous rocks of the Coastal Plain may bear a Triassic date; the youngest were emplaced in late Austin or early Taylor time.

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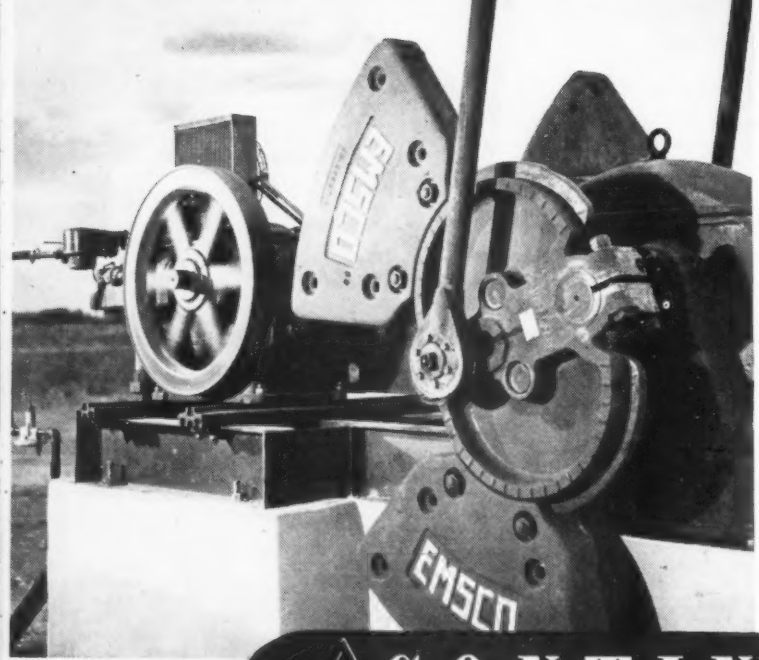

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TABLE 4—WEST TEXAS CRACKED GASOLINE—CATALYTIC DESULFURIZATION VS. END POINT REDUCTION

Nominal end point—	Charge		Rerun cuts					
	400° F.		375° F.		350° F.		325° F.	
	Raw	Desulf.	Raw	Desulf.	Raw	Desulf.	Raw	Desulf.
A.S.T.M. octane No.	51.1	60.8	56.9	63.0	59.2	64.8	61.2	66.3
Plus 1 ml. TEL	57.1	66.3	62.8	69.2	64.8	70.6	65.8	73.0
Plus 3 ml. TEL	64.2	72.0	68.7	74.8	70.4	75.5	70.9	77.9
Total sulfur, wt. %	0.289	0.154	0.281	0.148	0.283	0.156	0.273	...
Gravity, °A.P.I.	56.5	56.5	59.0	58.4	60.0	60.0	61.2	60.8
Reid vapor pressure	3.0	3.6	3.1	4.4	3.5	4.5	3.8	5.6
A.S.T.M. distillation, °F.:								
First drop	129	131	129	120	125	121	128	113
5% evaporated, 760 mm.	175	173	168	155	161	162	161	153
10% evaporated, 760 mm.	194	195	184	178	179	174	179	171
20% evaporated, 760 mm.	224	223	207	204	202	200	200	193
50% evaporated, 760 mm.	285	283	268	264	256	256	243	242
70% evaporated, 760 mm.	319	320	301	300	285	286	268	269
90% evaporated, 760 mm.	360	362	337	336	317	317	296	303
95% evaporated, 760 mm.	379	386	347	349	327	334	308	319
End point	404	455	364	410	352	382	332	392
Recovery, %	99.0	98.8	99.0	98.1	99.0	98.8	99.0	98.5
Residue, %	0.6	0.7	0.5	0.9	0.4	0.7	0.2	0.5
Loss, %	0.4	0.5	0.5	1.0	0.6	0.5	0.8	1.0
Yield, vol. % on 400° F.	100.0		86.6		77.6		67.1	

Catalytic Desulfurization

(Continued from page 98)

ships shown in Fig. 1. It will be noted that at any given clear or leaded octane value, greater yields are obtained by desulfurizing the reformer charge. In the higher leaded range especially, increased yields up to 6 per cent are possible at equivalent octane levels. Conversely at equivalent yields increased octane value products result for the desulfurized charge.

The economical utilization of catalytic desulfurization on any stream containing cracked gasoline depends for the most part on the inclusion of means for catalyst regeneration because the olefins present deposit carbonaceous material on the catalyst at a much more rapid rate than do the saturated hydrocarbons of a straightrun stock. Catalyst regeneration as hereinafter discussed has been developed to a high degree of efficiency and with the installation of auxiliary catalyst regenerating facilities, cracked gasolines either as separate streams or in blends of straightrun and natural gasoline, respond readily and economically to catalytic desulfurization.

Typical results from the catalytic desulfurization of a cracked straightrun blend are reported in Table 3. These data comprise those obtained from a recent test run on a blend consisting of approximately 50 per cent straightrun, 48 per cent Dubbs cracked, and 2 per cent poly gasoline from Michigan crude. It will be noted that the octane rating of the desulfurized gasoline containing 1 ml. TEL is about the same as the undesulfurized

TABLE 5—PILOT PLANT—PERCO CATALYTIC REFORMING ILLINOIS STRAIGHTRUN NAPHTHA

Yield summary:	Full range as received	Debutanized overhead fraction	Reformer charge	Test No. HL-1-1			Test No. HL-2-1		
				Ref. effluent	Blend No. 1*	Blend No. 2*	Ref. effluent	Blend No. 3*	Blend No. 4*
Dry gas, wt. %	...	...	...	4.63	...	...	8.17	...	...
C_4 total, vol. %	...	...	...	1.57	...	...	3.96	...	...
C_4 olefin, vol. %	...	...	...	1.00	...	...	2.97	...	...
C_5, heavier gasoline, vol. %	...	...	...	93.85	...	...	87.78	...	...
Carbon, wt. %	...	...	...	0.18	...	...	0.33	...	...
C_5, heavier inspection:									
A.S.T.M. octane, clear	54.1	62.4	36.7	45.6	53.6	56.9	52.6	57.5	60.2
Plus 1.0 ml. TEL/gal.	64.7	75.2	47.3	59.0	66.8	70.0	63.9	69.4	72.1
Plus 3.0 ml. TEL/gal.	73.0	83.4	59.4	70.8	76.8	79.6	73.8	78.6	81.2
Research octane, clear	52.7	64.8	33.8	47.8	...	...	54.6	...	...
Plus 1.0 ml. TEL/gal.	64.2	75.5	44.8	61.0	...	...	...	...	...
Plus 3.0 ml. TEL/gal.	74.2	83.8	58.8	72.4	...	...	76.4	...	...
Total sulfur, wt. %	0.022	...	...	0.008	...	...	...	...	...
Reid vapor pressure	10.1	7.2	0.8	1.3	4.4	10.0	1.7	4.8	10.0
Gravity, °A.P.I.	64.4	70.6	54.7	54.5	...	...	54.3	...	...
Distillation, °F.:									
First drop	91	111	242	175	...	...	149	...	...
5% evaporated	112	133	257	230	...	...	217	...	...
10% evaporated	140	141	263	250	...	...	235	...	...
20% evaporated	172	151	269	264	...	...	254	...	...
50% evaporated	236	174	289	288	...	...	283	...	...
70% evaporated	274	190	305	305	...	...	300	...	...
90% evaporated	313	211	331	332	...	...	329	...	...
95% evaporated	333	223	341	344	...	...	342	...	...
End point	362	268	368	394	...	...	388	...	...
Recovery, %	96.8	98.1	99.0	99.0	...	...	98.9	...	...
Residue, %	0.4	0.5	0.3	0.5	...	...	0.6	...	...
Loss, %	2.8	1.4	0.7	0.5	...	...	0.5	...	...
Operating conditions:									
Top catalyst temperature, °F.	...		...	1,010	...	...	1,030	...	...
Flow rate, vol./vol./hr.	...	...	...	1.97	...	...	1.95	...	...
Pressure, psig.	...		...	50	...	...	50	...	...
Composition, vol. %:									
Full range as received	100.0	41.35	48.09	45.13	86.48	95.12	42.21	83.56	91.50
Cat. reformed gasoline	...	...	...	100.00	52.2	47.4	100.00	50.5	46.1
Debutanized overhead	...	100.00	...	...	47.8	43.5	...	49.5	45.2
n-Butane	...	...	...	...	None	9.1	...	None	8.7
Excess butane, %	...	...	...	...	...	2.7	...	...	3.3

*Calculated data.

gasoline containing 3 ml. TEL. This operation was continued for a total of 6 days representing a total gasoline throughput in excess of 930 bbl. per ton of catalyst. During the course of the test the reactor outlet was increased gradually in temperature from 725° to 790° F. to compensate for loss in catalyst activity due to carbon deposition. For the first 500 bbl. per ton of catalyst, the caustic-washed reactor effluent was sweet to the doctor test but became slightly sour as the test proceeded.

In recent months more and more refiners have been required to adopt the practice of undercutting end point to meet required octane specifications. Appreciable octane increases can be obtained in this way and specifications temporarily met. The practice is costly, however, in that whatever product is removed from the gasoline must be disposed of in a lower price bracket. In this connection the data in Table 4 will be of interest. These data show the comparison between desulfurization and end-point reduction. A debutanized 400-end-point cracked gasoline was refractionated to products of 375°, 350°, and 325° end point. A portion of each of these samples was then desulfurized in the pilot plant over bauxite at 750° F. It will be noted that desulfurization of the 400° F. stock gave more octane increase than a 75° F. reduction of end point which also resulted in loss of 33 per cent of the original stock. Expressed in other terms, catalytic desulfurization of the 400° end point full range gave 51 per cent more barrel octane numbers at the 3-ml. TEL level than reduction of the raw charge to 325° end point.

Cycloversion (Catalytic Reforming)

Perco Cycloversion of conventional catalytic cracking feed stocks has been the subject of numerous articles published in the recent past.[9 10 11 12] While the present discussion will not cover this process as it is generally known, it is desirable to point out the results obtainable from a modification of the Cycloversion process known as Perco Catalytic Reforming. Such a modification of Cycloversion is applicable to motor-fuel boiling-range stocks and naphthas and, in some cases, to heavy naphthas competitive with thermal reforming. The operation is conducted at moderate pressures of the order of 50 to 100 psig. and at temperatures ranging from 950° to 1,050° F.

The normal benefits derived from catalytic desulfurization per se are obtained together with an appreciable increase in clear octane rating due to some additional mild cracking or reforming as evidenced by the production of fixed gases and increasing hydrocarbon destruction with increasing severity of operating conditions. Numerous pilot-plant and semicommercial-scale tests have been made over the past several years. The more recent tests have been conducted at two or more destruction levels with particular attention given to carbon deposition, as a guide to regeneration equipment design, and fixed gas production in relation to over-all motor fuel recovery.

While the pilot-plant test runs have all been more or less for 24-hour periods, economical operations may be realized up to 48 or 72 hours on process cycles.

Typical results from this type operation are given in Tables 5 to 9. The data shown in Table 5 represent preliminary fractionation of a full-range Illinois straightrun gasoline and subsequent reforming at two destruction levels, both reforming tests being over "Cyclocel" at 50 lb. pressure on the naphtha fraction only. The full-range sample as received was debutanized, by removal of 10.56 per cent as C_4 and lighter. An overhead fraction representing 41.35 per cent of the sample as received was taken off, leaving a naphtha residue representing 48.09 per cent of the full range as received as reformer charging stock. This charge stock was subjected to two different tests at destruction levels of 4.63 and 8.17 per cent (basis C_4—heavier gasoline recovery) at 1,010° and 1,030° F. respectively.

TABLES 6 AND 7—PILOT PLANT—PERCO CATALYTIC REFORMING

	West Texas straightrun gasoline					Kansas cracked and straightrun gasolines					
						Straightrun gasoline			Cracked gasoline		
Yield summary:	Debutanized ref. charge	Test No. HJ-1-1	Gain	Test No. HJ-2-1	Gain	Debutanized ref. charge	Test No. HB-1-1	Gain	Debutanized ref. charge	Test No. HK-1-1	Gain
Dry gas, wt. %	...	3.06		5.99		...	6.52		...	5.39	
C_4 total, vol. %	...	2.00		3.47		...	4.72		...	4.66	
C_4 olefin, vol. %	...	1.25		2.45		...	2.69		...	2.80	
C_5+ heavier gasoline, vol. %	...	96.13		90.66		...	88.23		...	88.46	
Carbon, wt. %	...	0.19		0.29		...	0.40		...	0.54	
C_5+ heavier inspection:											
A.S.T.M. octane, clear	51.6	59.2	7.6	61.5	9.9	43.8	55.9	12.1	63.1	67.8	4.7
Plus 1.0 ml. TEL/gal.	57.3	69.5	12.2	71.6	14.3	54.1	67.6	13.5	69.6	74.9	5.3
Plus 3.0 ml. TEL/gal.	66.5	77.3	10.8	78.9	12.4	66.1	76.7	10.6	75.5	78.8	3.3
Research octane, clear	53.7	61.4	7.7	65.2	11.5	41.6	56.7	15.1	69.6	75.3	5.7
Plus 1.0 ml. TEL/gal.	59.7	70.4	10.7	75.0	15.3	52.3	67.9	15.6	77.6	82.3	4.7
Plus 3.0 ml. TEL/gal.	68.6	80.2	11.6	82.9	14.3	65.7	78.3	12.6	85.4	87.5	2.1
Total sulfur, wt. %	0.165	0.035		0.023		0.027	0.005		0.089	0.063	
Reid vapor pressure	3.4	3.9		3.2		4.2	5.0		6.2	4.1	
Gravity, °A.P.I.	54.6	55.4		56.6		61.7	60.9		59.9	56.6	
Distillation, °F.:											
First drop	138	121		130		121	111		101	125	
5% evaporated	167	157		166		152	139		130	154	
10% evaporated	185	176		182		170	157		141	164	
20% evaporated	209	201		205		194	182		161	177	
50% evaporated	274	263		266		254	243		228	238	
70% evaporated	322	313		311		296	285		283	291	
90% evaporated	384	378		378		350	343		346	357	
95% evaporated	407	403		403		369	363		369	384	
End point	432	450		452		396	412		398	418	
Recovery, %	98.5	98.1		98.8		98.7	98.2		98.2	98.7	
Residue, %	0.7	0.9		0.7		0.4	0.6		0.3	0.8	
Loss, %	0.8	1.0		0.5		0.9	1.2		1.5	0.5	
Operating conditions:											
Top catalyst temperature, °F.	...	1,001		1,030		...	1,001		...	1,009	
Flow rate, vol./vol./hr.	...	1.91		2.01		...	1.93		...	2.01	
Pressure, psig.	...	50		50		...	50		...	50	
Calculated 10-lb. blends:											
Butane required at 10 lb. R.v.p., %	11.5	11.0		11.9		10.2	9.2		7.2	10.5	
A.S.T.M. octane, clear	56.1	62.6	6.5	64.9	8.8	48.5	59.1	10.6	65.2	70.1	4.9
Plus 1.0 ml. TEL/gal.	62.4	73.2	10.8	75.2	12.8	58.9	70.8	11.9	71.9	77.7	5.8
Plus 3.0 ml. TEL/gal.	71.4	80.8	9.4	82.5	11.1	70.5	79.7	9.2	77.9	81.9	4.0

Calculations based upon reblending the overhead and reformed fractions are quite interesting in that they project the production of 79.6 and 81.2 A.S.T.M. octane number at 3 ml. TEL per gallon against 73 A.S.T.M. octane number with 3 ml. TEL per gallon on the sample as received. These tests reflect a very substantial octane appreciation for a low-sulfur charging stock which cannot be attributed to desulfurization alone.

Another series of tests shown in Table 6 was performed on a full-range, debutanized West Texas straightrun having a total sulfur content of 0.165 per cent. These tests were made at 1,000° and 1,030° F. with destruction of 3.06 and 5.99 per cent of the charge respectively. The octane appreciation was 7.6 numbers clear and 10.8 with 3 ml. TEL even at the low dry gas loss of only 3.06 per cent.

A series of tests was made on both a Kansas straightrun gasoline and cracked gasoline, Table 7. The debutanized feeds are characterized in columns 1 and 4 while the reforming effluents are shown in columns 2 and 5 respectively. These tests, showing octane-number improvements of 10.6 and 3.3 respectively for the straightrun and cracked, illustrate the results which may be obtained by processing the entire refinery gasoline production.

It is of interest to compare these data with those obtained from reforming a heavy straightrun-cracked naphtha blend, Table 8. The total refinery gasoline, column 1, was separated into the following fractions:

Butane and lighter	6%
Light overhead	34%
Heavy naphtha	60%

The heavy naphtha, representing 60 per cent of the total gasoline, was reformed at about 10 per cent destruction (6 per cent basis full range). The reformed naphtha blended back with the 34 per cent of light overhead fractions gave 77 A.S.T.M. octane at 3 ml. TEL per gallon and 4.5 lb. Reid vapor pressure. The 10 lb. Reid vapor pressure butanized blend showed an A.S.T.M. octane number of 79.1 at 3 ml. TEL or an improvement of 4.4 over the 10-lb. charge. It will be noted in this, as well as in the other tests, that even more improvement was obtained in Research ratings than in A.S.T.M. ratings. Dehydrogenation is one of the major reactions which occur, thereby increasing the olefin content and sensitivity of the reformed product. Table 9 exemplifies expected results on a total refinery gasoline containing 0.08 weight per cent sulfur, wherein it is shown that with a recovery of 95.45 volume per cent of the feed the over-all octane improvement is 6.1 and 8.5 A.S.T.M. and Research octane respectively at 3 ml. TEL per gallon.

Catalyst Regeneration

In the course of the cracked-gasoline desulfurization and catalytic-reforming operations previously discussed, there is a gradual decline in catalyst activity which ultimately reaches a point below which it is not economical to operate. In the case of straightrun or natural-gasoline desulfurization there is less incentive to utilize catalyst regeneration inasmuch as the gasoline throughput is in the range of 5,000 to 15,000 bbl. per ton of catalyst, resulting in actual catalyst costs of 1.2 to 0.4 cents per barrel of gasoline treated merely by replacing the catalyst with a new charge.

The decline in catalyst activity, which may be compensated for to some extent by increasing the operating temperature, is due to the deposition of carbonaceous matter, which

TABLES 8 AND 9—PILOT PLANT—PERCO CATALYTIC REFORMING

	Blend Kansas cracked-straightrun naphtha						West Texas total refinery gasoline				
	Total refinery blend	Heavy naphtha ref. charge	Test No. HH-1-1	Gain	Blend No. 1	Blend No. 2	Debutanized ref. charge	Test No. HF-1-1	Gain	Test No. HF-2-1	Gain
Yield summary:											
Dry gas, wt. %	...	...	10.06		...	...	...	5.41		10.84	
C_4 total, vol. %	...	...	4.76		...	...	...	5.65		7.06	
C_4 olefin, vol. %	..	..	3.72		..	..	...	3.07		4.36	
C_5+ heavier gasoline, vol. %	..	..	85.31		..	..	..	89.80		81.13	
Carbon, wt. %	..	..	0.65		...	..	...	0.50		0.70	
C_5+ heavier inspection: •											
A.S.T.M. octane, clear	60.7	48.5	63.4	14.9	61.1	64.4	57.2	62.7	5.5	65.6	8.4
Plus 1.0 ml. TEL/gal.	67.6	57.4	68.7	11.3	...	72.7	63.8	71.4	7.6	73.6	9.8
Plus 3.0 ml. TEL/gal.	74.7	66.3	75.3	9.0	77.0	79.1	71.6	77.7	6.1	78.6	7.0
Research octane, clear	61.6	47.2	64.6	17.4		69.7	59.5	67.1	7.6	70.6	11.1
Plus 1.0 ml. TEL/gal.	70.2	56.0	72.2	16.2		77.6	66.9	75.7	8.8	78.8	11.9
Plus 3.0 ml. TEL/gal.	78.4	68.6	79.4	10.8	..	84.4	74.8	83.3	8.5	84.9	10.1
Total sulfur, wt. %		0.068	0.058		0.052	0.047	0.082	0.032		...	
Reid vapor pressure	10.2	2.0	1.6		4.5	10.1	4.8	4.1		3.6	
Gravity, °A.P.I.	62.0	51.4	50.2		58.5	62.2	59.2	57.2		56.7	
Distillation, °F.:											
First drop	94	230	160		122	81	117	122		131	
5% evaporated	113	249	214		148	100	153	154		157	
10% evaporated	136	263	231		160	120	169	168		168	
20% evaporated	168	273	252		180	151	193	189		187	
50% evaporated	251	303	288		242	229	253	247		243	
70% evaporated	297	331	327		289	278	293	288		287	
90% evaporated	352	365	373		353	349	342	342		342	
95% evaporated	371	381	395		373	376	362	362		363	
End point	398	412	428		408	410	391	405		401	
Recovery, %	96.8	98.0	98.9		98.9	98.0	98.9	98.2		98.1	
Residue, %	0.6	0.3	0.7		0.8	1.0	0.2	0.4		0.9	
Loss, %	2.6	1.7	0.4		0.3	1.0	0.9	1.4		1.0	
Operating conditions:											
Top catalyst temperature, °F.	...	..	1,020					1,000		1,020	
Flow rate, vol./vol./hr.	....	...	1.76		..	..	..	1.96		2.01	
Pressure, psig.	...	...	50		..	..	..	50		50	
Composition, vol. %:											
Total refinery gasoline	100.00	60.00	51.19		85.19	93.73	...	...		...	
Straightrun gasoline	60.00	36.00	...		...	...	..	...		...	
Cracked gasoline	40.00	24.00					..	...		...	
Cat. reformed gasoline	...	...	100.00		60.2	54.7	...	...		...	
Light straightrun	...	...	...		23.9	21.7	...	...		..	
Light cracked	...	...	...		15.9	14.5	...	...		..	
n-Butane	...	...	...		None	9.1	...	...		...	
Calculated 10-lb. blend:											
Butane required at 10-lb. R.v.p., %	...	...	..		...	...	9.5	10.5		11.2	
A.S.T.M. octane, clear	...	...	...		...	...	60.4	65.7	5.3	68.4	8.0
Plus 1.0 ml. TEL/gal.	...	...	...		...	...	67.4	74.5	7.1	76.8	9.4
Plus 3.0 ml. TEL/gal.	...	...	...		...	..	75.1	81.0	5.9	82.0	6.9

is referred to here as "carbon." Among the various factors affecting carbon deposition are (a) nature of the stock, (b) severity of treatment or time-temperature relationship, and (c) length of process period. Carbon deposition increases in relation to increases in the time-temperature relationship for any given stock and for given conditions is lower for straightrun than for cracked gasolines. Blends of cracked and straightrun materials are intermediate to those of straightrun and cracked per se as to carbon depositions. Temperature ranges of 700° to about 1,050° F. and pressures as high as 200 lb. can be utilized in selecting optimum treating conditions.

Catalytic regeneration has been practiced in a 12,000-bbl. per day Cycloversion catalytic cracking unit for over 2 years. This procedure, as is now practiced in more recently constructed Perco units, comprises burning off the carbonaceous deposits on the catalyst in an atmosphere of air in admixture with superheated steam as a diluent and coolant. Fig. 2 illustrates the procedure incorporated in a desulfurization-catalytic reforming unit in conjunction with other necessary processing equipment.

The process period involves charging the feed by a suitable pump in heat exchange with the catalyst tower effluent, thence to the product heater from which it passes at the optimum temperature and space velocity downward through the chamber on process. The catalytically treated vapors pass thence in heat exchange with the fresh feed, to the product cooler and finally to product accumulator. Disposition of the accumulator product will depend on the stock and nature of the operation. Depending on the nature of the feed stock, the temperature of the operation, and the space velocity, all of which affect the rate of carbon deposition on the catalyst, and hence catalyst activity, the process period will range from about 24-48 hours in the case of cracked-gasoline desulfurization and catalytic reforming operations, to 50 days or more in the case of some straightrun desulfurization operations.

The regeneration operation contemplates charging to the alternate chamber sufficient air to complete the burnoff in the required time, such air being in admixture with a predetermined quantity of steam superheated to give a temperature of about 750° F. for the mixture entering the reactor on regeneration. The proportion of steam to air is determined by the maximum temperature rise desired in the catalyst bed. The total amount of air required is dependent upon the amount of carbon to be removed while the rate at which it is added is governed by the permissible length of regeneration period. The regeneration effluent gases are discharged to the atmosphere through a suitable vent stack.

Remarks

The significance of the foregoing data is obvious in that such installations can be made in conjunction with existing refinery facilities to obtain pronounced octane improvements, comparable to and in many cases greater than can be obtained by installing the more expensive catalytic-cracking plants. However, the operations previously described will also be applicable to a very great extent in refineries having catalytic-cracking facilities for processing the straightrun gasoline fractions from both low-sulfur and high-sulfur stocks. This is true, of course, because the processes as described by Noll et al[13] and Reed[14] before the annual session of the W.P.R.A., March 1946, are not generally applied to stocks boiling within the motor-fuel range. With every increase in the octane-number specifications, the retarding or degrading effects of the relatively low-octane straightrun fractions of any refinery become more and more pronounced; and as long as straightrun fractions are used in motor-fuel blends, the need for upgrading these stocks will remain a very vital consideration.

The flexibility of a unit as described

Republic National Bank of Dallas

Statement of Condition September 30, 1946

RESOURCES

Loans and Discounts	$132,729,368.16
Customers' Liability—Letters of Credit	3,344,749.27
Banking House	2,210,832.76
Furniture and Fixtures	286,300.32
Real Estate for Bank Expansion	240,474.84
Stock in Federal Reserve Bank	600,000.00
U. S. Government Securities	58,095,545.33
Other Bonds and Securities	2,830,882.71
Cash and Due from Banks	65,611,353.75
Total	$265,949,507.14

LIABILITIES

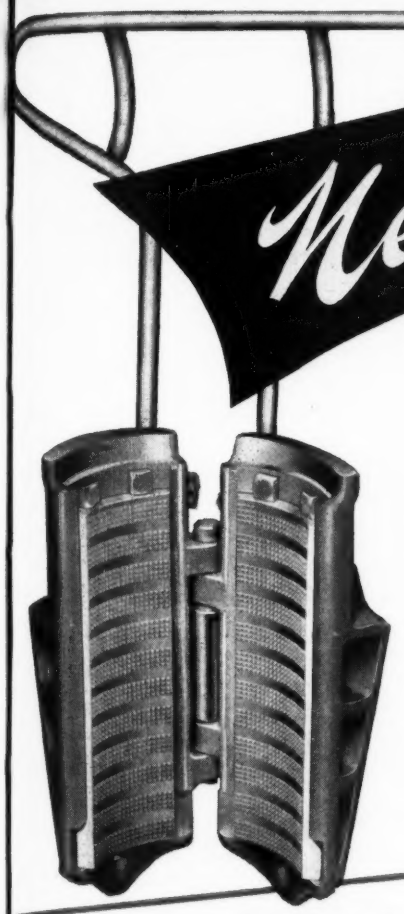
Capital	$ 10,000,000.00	
Surplus	10,000,000.00	$ 20,000,000.00
Undivided Profits		2,252,076.91
Reserve for Dividend—		
Payable October 1, 1946		200,000.00
Reserve for Taxes, Etc.		1,885,822.43
Letters of Credit		3,344,749.27
DEPOSITS:		
Individual	$144,464,155.27	
Banks	74,884,960.85	
U. S. Government	18,917,742.41	238,266,858.53
Total		$265,949,507.14

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Baash-Ross News

BAASH-ROSS TOOL COMPANY · LOS ANGELES · HOUSTON · NEW YORK

OUR 26th YEAR



New! BAASH-ROSS "2MB" TWO-MAN ROTARY SLIPS

One Body Fits Many Pipe Sizes
Segmented Liners Cut Maintenance
Light Weight—Balanced Design
Protective Safety Handles

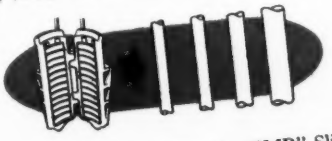
FOR those operators who prefer a two-man rotary slip, Baash-Ross has developed the new "2MB" Rotary Slips which embody far-reaching advancements that insure better slip performance, greater crew efficiency, minimum maintenance and inventory costs.

"2MB" Slips are a two-man version of the famous Baash-Ross "DU" Rotary Slips that have proven so popular with operators everywhere. "2MB" Slips incorporate the same unique advantage in that each body size fits a wide range of pipe diameters by simply changing liners. Segmented liners are another important feature that cuts inventory costs, insures better grip efficiency and minimizes liner replacement. "2MB" Slips are light in weight and balanced for easy handling and maximum convenience to the crew. Their safety handles not only have guards to protect the workmen's hands, but also have large loops that safeguard against the Slip being dropped into the hole through the master bushing.

The new "2MB" Rotary Slips are available in three basic body sizes—4-½", 5-⅜" and 7"—*and by simply changing liners,* these three body sizes fit all pipe diameters from 2-⅜" to 7". They are also available in "Short" and "Long" types to meet every load requirement. The "Short" type has a gripping surface 12" long and is recommended for all drill strings to 8,000 ft. The "Long" type has a gripping surface 16" long and is recommended for the deepest wells and heaviest drill strings. Check over these important features . . .

"2MB" Features That Save Time, Boost Efficiency!

MONEY-SAVING ADAPTABILITY: With "2MB" Slips there is no need to stock a different-sized slip body for each different size of pipe used in your drilling operations. *By simply changing the liners*—a quick, inexpensive operation—the same "2MB" Body can be quickly adapted to fit a wide range of pipe sizes. For example, by changing only the liners, the 4" Body fits 2-⅜", 2-⅞", 3-½" and 4" pipe!



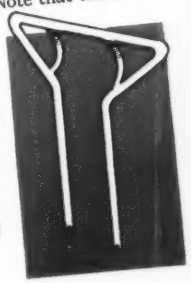
SEGMENTED LINERS: Liners in "2MB" Slips are in 4" segments that are rigidly locked into the body to form a continuous gripping surface. No need to stock separate liner lengths for 12" and 16" slips. *Three* 4" segments make a 12" liner—*four* segments make 16" liner. This feature cuts inventory costs to the bone!

Also, if liners wear unevenly, there's no need to throw away the entire liner when one portion becomes worn. Simply switch or invert worn with unworn segments for additional liner life *without replacing a single part.* Or, if badly worn, replace only the worn segments and continue to get additional life from the other segments. You get longer liner life at much lower cost!

LIGHT WEIGHT, BALANCED DESIGN: Note how the body sections are cored out to eliminate weight without sacrificing strength. "2MB" Slips have ample strength for the heaviest service. Yet their unusually light weight and balanced handling reduces crew fatigue to a minimum and speeds round trips.

RIGID LINER SUPPORT: The liner segments are rigidly supported in the slip body so that all working stresses of both supporting the pipe and of rotating it when breaking out joints are transmitted *directly* to the slip body. There are no retaining members to become sheared or broken and drop the liners in the hole.

FULL SAFETY HANDLES: Note that the safety handles not only embody guards to protect the crew against pinched hands, but they also have wide loops that safeguard against the slips being dropped through the table or into the hole... both important safety features!



The above are only typical of many "2MB" Slip advancements. Get complete details on these new Baash-Ross Two-Man Rotary Slips from your nearest representative—or write direct!

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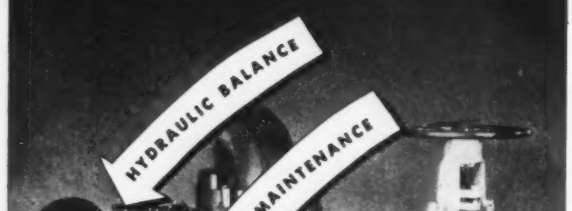

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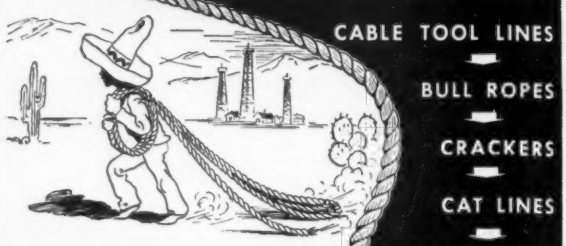

SAND, dirt or grit is just as destructive in a rope as it is in a piece of machinery. Any such abrasive material left on a rope soon works into the strands. These particles then cut fibers and seriously weaken the rope.

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in Fig. 2 will enable refiners to conduct a wide variety of operations on selected fractions or on the total refinery gasoline, as may be desired or dictated by economics and finished-product sales. Obviously there are many combinations of application and the selection of optimum operating conditions and charge stocks will be influenced by many factors. The extreme flexibility of the process, however, will enable the refiner to vary the operations at any time to handle the preferred stock or stocks at conditions to meet product specifications with optimum tetraethyl lead costs.

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Pressure-Controlled Intermitters

(Continued from page 95)

utes. A marginal producer charted in Fig. 3 showed the same irregularity of pressure buildup, the actual shut-in periods measuring 5 hours 15 minutes, 5 hours 40 minutes, and 6 hours 10 minutes for the three complete cycles shown on the day charted.

Although the pressure-controlled intermitter has proved successful in improving the production of many high-gas-oil-ratio wells, it should not be construed as a cure-all for all such wells. No yardstick of adaptability exists, other than the general well performances already noted. Since wells, even from common reservoirs, often show marked individual characteristics, each prospective well for this type of control should be subjected to detailed engineering study while flowing and shut in. By manually stop-cocking the well at varying intervals, observing oil and gas volume, tubing and casing-pressure trends and their relation to gas breakthrough, the feasibility of installing a pre sure-controlled intermitter can be determined. Once installed, the device should be carefully adjusted for optimum conditions of oil production and gas-oil ratio by continued studies of the same conditions, employing a portable two-pen recorder for tubing and casing pressures. Even after initial pressure settings are fixed, periodic pressure records should be taken as a check on the well's performance.

Because of the shortage of engineers in the field, few detailed tests of the intermitter have been completed at this time. In such tests that were made, results varied with the type of well studied. On some wells,

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pressure-controlled stop-cocking showed no improvement over other production methods, while in others gas-oil ratios were reduced as much as 80 per cent and production more than doubled. Another improvement noted in some wells was the elimination of paraffin trouble. When allowed to blow dry gas, wells showed heavy deposits in the tubing, probably caused by the drying and cooling effect of the gas. Prevention of gas breakthrough automatically solved that problem.

Test Data

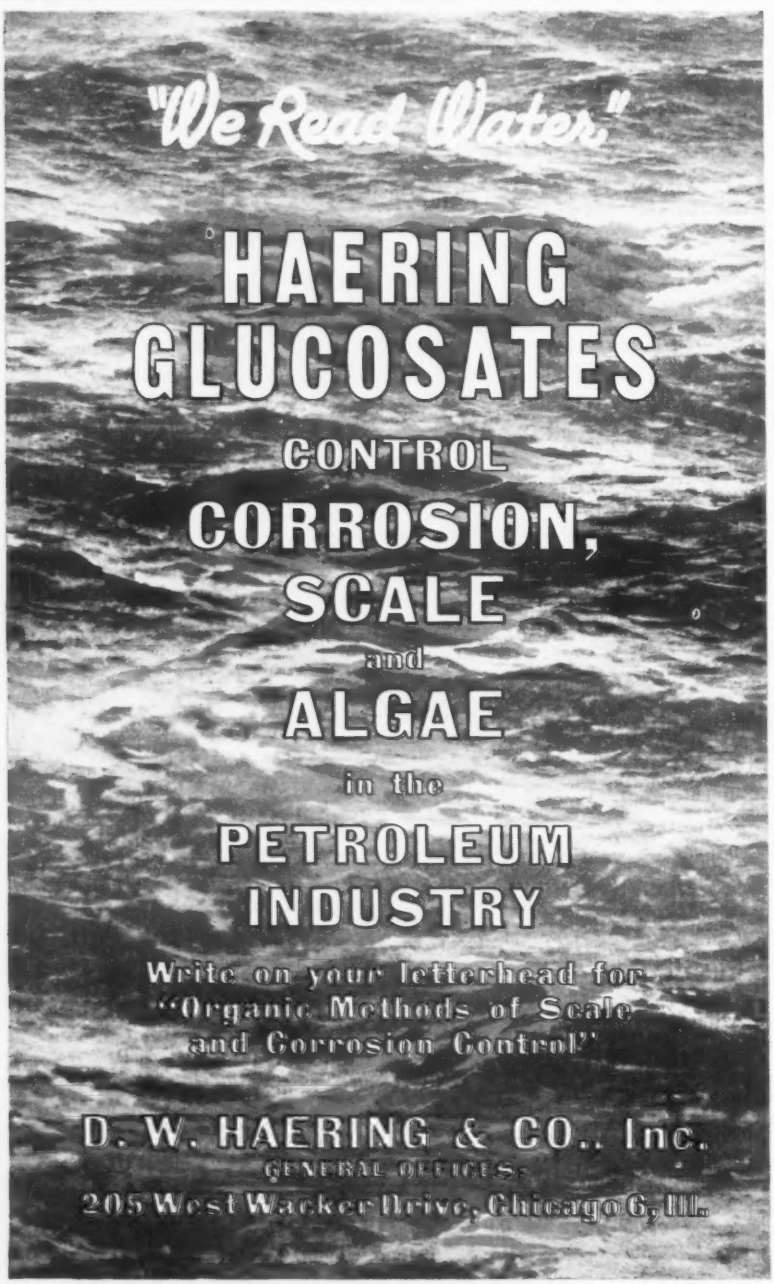
Of the tests made with accurate volume and pressure measurements, three examples in the Dollar Hide, Goldsmith, and Turkey Track fields well represent the range of intermitter operations in the district. A well in the Dollar Hide field producing with a low annular fluid level frequently showed gas breakthrough on continuous flow. Engineers reduced choke sizes to 13/64 in., cutting oil production and minimizing but not eliminating the dry gas blow. An intermitter was installed to operate between casing pressures of 1,800 and 1,775 psi. and the well was equiped with a 24/64-in. choke. Fluctuation of the casing pressure through the 25-lb. range was so rapid that the well produced in from 40 to 45 cycles per hour, flowing for about 45 seconds and remaining shut in for about the same period. Gas breakthrough was entirely eliminated. At the high casing pressures encountered, gas condensate at first froze in the controller head. Engineers installed a knockout trap ahead of the controller and eliminated the trouble, but found it necessary to break the line from the casinghead at frequent intervals and blow it clear of condensate.

During the week prior to installation of the intermitter, the well produced a daily average of 64 bbl. of oil through 13/64 and 14/64-in. chokes at gas-oil ratios averaging 1,700 cu. ft. per barrel. At times when the well blew gas, daily ratio averages rose to as high as 5,000. At the end of several weeks of testing with the intermitter, the well was producing an average of 104 bbl. of oil daily at ratios averaging 1,000 cu. ft. per barrel.

Two wells in the Goldsmith field tested by two different operators showed similar improvements. The first well, (Fig. 4), under ordinary stop-cocking methods produced an average of 9.4 bbl. of fluid daily, consisting of 8 bbl. of oil and 1.4 bbl. of water. The gas-oil ratio was 9,438 cu. ft. per barrel. An intermitter was installed to open the well when casing pressure reached 460 psi. and shut it in when it declined to 380 psi. The well flowed at intervals of about once every 30 minutes. After the intermitter was adjusted to proper conditions, the well averaged 16.8 bbl. of oil, no water, with a gas-oil ratio of 3,679 cu. ft. per barrel.

A second well in the field showed a potential of 19 bbl. of oil daily at ratios averaging 14,000 cu. ft. per barrel under manual production methods. An intermitter with a snap range set at 600 and 450 psi. allowed the well to maintain its 19-bbl. average at a gas-oil ratio reduced to 7,000 cu. ft. per barrel. Lowering the snap range to 420 and 385 psi. improved production to 39 bbl. daily and further reduced the ratios to 4,140. The well flowed between 70 and 80 times daily. The gas-oil ratio reduction increased the well allowable from 9 to 18 bbl. daily.

Application of the intermitter to small production is well illustrated in the Turkey Track and Loco Hills fields of New Mexico. There, wells producing less than 3 bbl. daily will not justify pumping installations, and extension of flowing life by reducing gas-oil ratios is of prime importance. Pressure-controlled intermitters have succeeded in reducing ratios by 75 per cent, at the same time maintaining production at previous levels. In such installations where very small amounts of gas are encountered and pressure build-up in the casing is extremely slow, even slight gas leakage through the motor valve would



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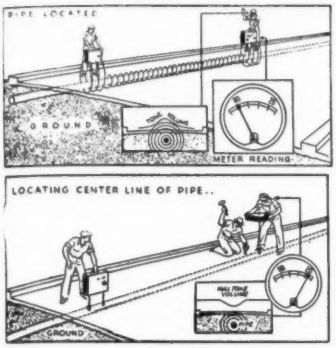

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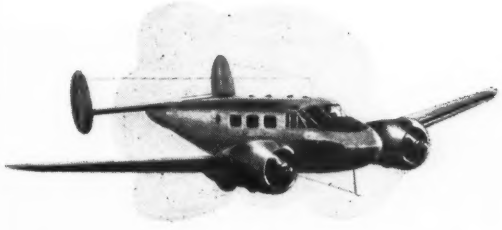

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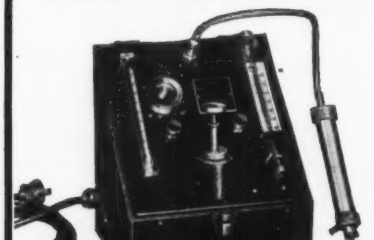

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prevent the casing pressure from building up to the required point to flow the well. A neoprene cup-type valve which will not sand out, and capable of withstanding pressures up to 500 psi. has been installed in controllers in these fields, providing positive gas shutoff.

Fat-Oil Deethanization

(Continued from page 109)

Estimates of cost for the two units were made. Unit prices used in the estimates are those prevailing during the construction of Plant A. Our estimate shows that the Plant A would cost about $40,000 less than Plant B.

TABLE 3—EXTRA RETURNS OF FAT-OIL DEETHANIZER

	Yearly
Propane	$52,000
Less extra fuel	5,500
Less fuel value of extra propane	15,000
Other cost differences	500
Net gain, say	$31,000

This gain still does not allow for the extra first cost of Plant B. Here such an allowance might be made. Say we wish to pay off original costs in 4 years. The man with the Plant A would have $165,000 more in his bank account than the man with Plant B. This sum consists of $120,000 made on extra propane, and $40,000 that he did not spend on the original plant. The average is some $40,000 per year for the 4 years.

All the foregoing assumes that propane can be sold as a product. What happens if propane liquid has absolutely no sale? Plant A costs $5,500 more per year to operate than Plant B. And the cost of Plant B goes down because the gasoline - deethanizer comes out. But the reabsorber stays in to hold butanes. Other items remain the same. The cost reduces by about $50,000. This credit seems low. A gasoline-deethanizer installed by itself costs much more.

But in making our estimate, the gasoline-deethanizer was given all the breaks possible in first cost. Miscellaneous expenses were not increased. And more than full allowance was made for simultaneous construction. Only $50,000 was put in for this column, so that is all we can take out.

This "no propane" picture makes the fat-oil deethanizer uneconomical, by the $5,500 per year for extra fuel. And the plant for no propane costs a little less.

Summary

Operating cost of a fat-oil deethanizer is higher than the usual type of plant. For practical purposes this extra cost is fuel cost. The fat-oil deethanizer does not fit certain cases. The case where the primary purpose is recovery of propane or propylene. A special plant is required. Nor does it fit the case where a side-stream of propane is sufficient in quantity and quality, to supply the market. Operating cost, and to some extent first costs, make it unattractive. Where oil rates are set by butane recovery, and a good market for propane exists, the fat-oil deethanizer has excellent possibilities.

A.I.M.E. Digests

(Continued from page 110)

wave length (1 ten-billionth of an inch). They are very penetrating and can go through five strings of casing.

Radioactive Rocks

Among the sedimentary rocks the brown, organic shales stand out with high values. Rhyolitic ashes and bentonites, especially if young in origin, have even higher values. Clean sands have very low values as do limestones and barren silts and shales.

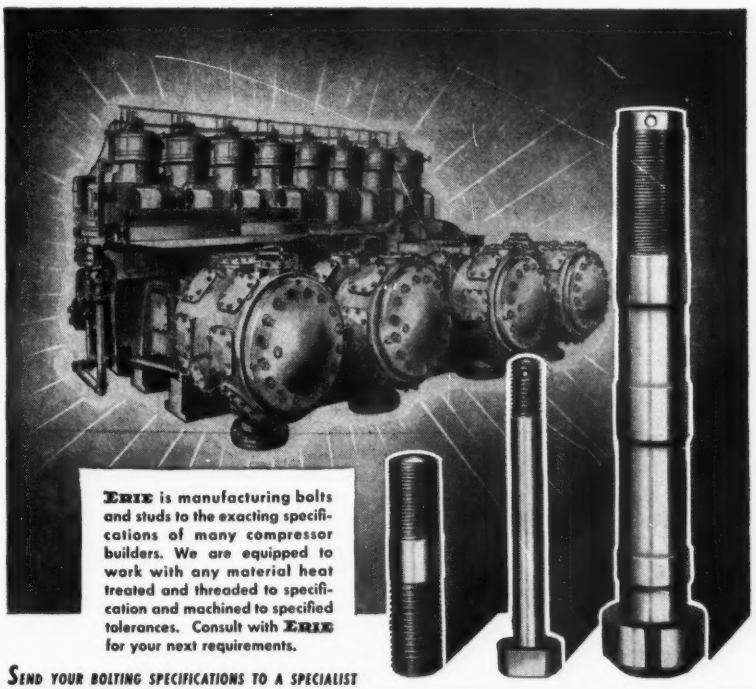
Correlations in the San Joaquin Valley

Bentonite and ash markers show up as long, sharp kicks on the radioactivity log where they may not show at all on electric logs. This is important in sections where continental beds prevail, such as the Zilch formation in the Helm field and the Kern River Series at Edison.

Sporbo and phosphatic nodules are radioactive and show up in the basal Etchegoin beds in the Cymric field logs.

Some of the brown, organic shales in the San Joaquin Valley, such as the Kreyenhagen shale in the Coalinga and Helm fields, do not show high radioactive values. This may be due to the derivation of the shale from Franciscan rocks, composed of basalt and serpentine, on the west side of the valley.

SEE PAGE 58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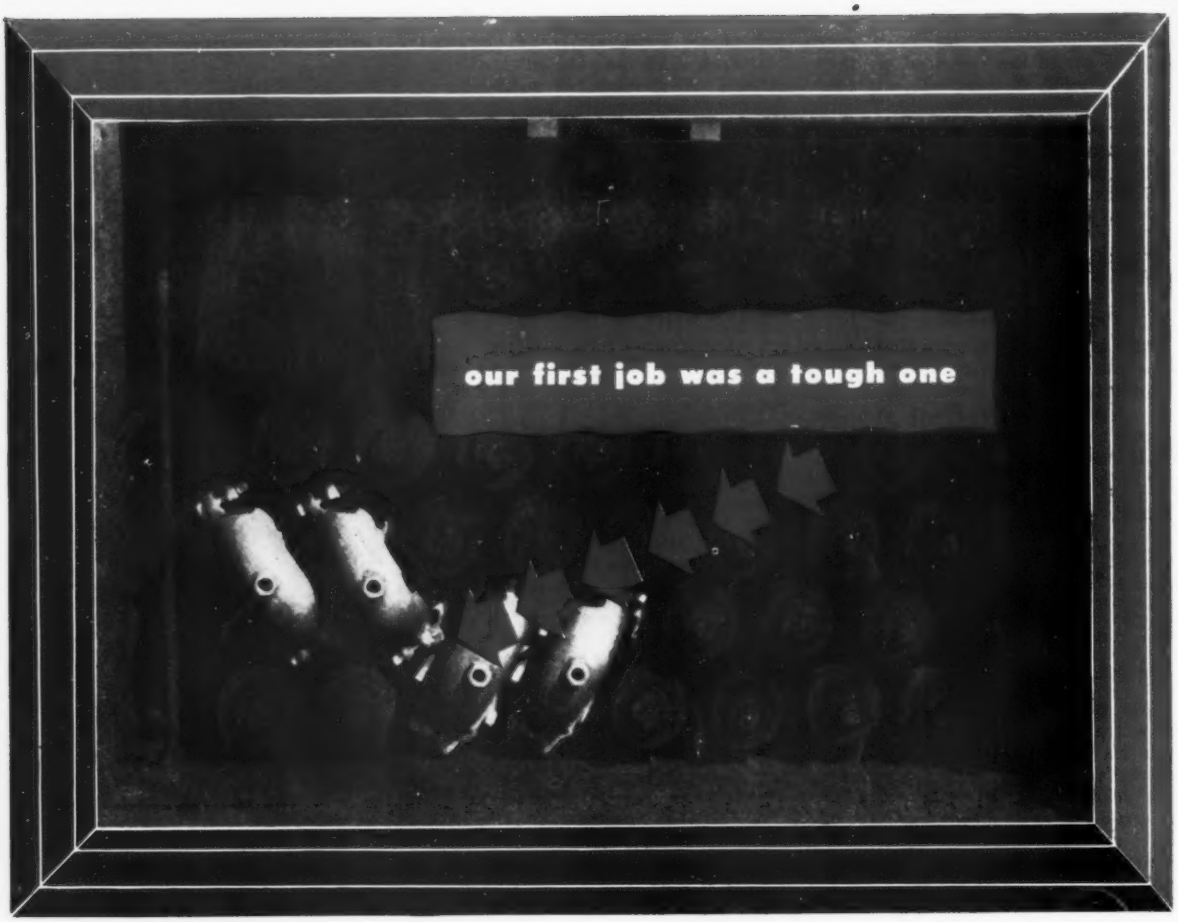

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The success of this installation has lead to the selection of UNIBOLT Furnace Fittings for numerous petroleum processing and chemical plants, including several extremely high temperature installations involving the lightest gases (hydrogen, for example) and furnace temperatures ranging up to 1600° F. A synthetic phenol plant is using these UNIBOLT fittings to seal 4000 psi in 5" o.d. tubes.

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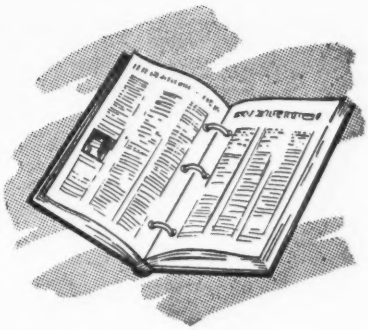


Tube Diameter and Thickness

Inside tube diameter is dependent on the liquid velocity that must be employed to avoid overheating (The Refiner's Notebook No. 111, September 21, 1946) and the pressure drop that can be tolerated. Customarily, the approximate cold (60° F.) velocities of Table 1 are adopted and only after the entire design is completed, including pressure-drop computations, may minor adjustments in tube size be contemplated.

TABLE 1 — APPROXIMATE TUBE VELOCITIES BASED ON VOLUME AT 60° F.

	Ft. per sec.
Vacuum distillation	0.5-4
Topping to 500° F.	2-3
Topping to 600° F.	2-4
Topping to 800° F.	3-5
Rerun—pressure distillate	3-4
Viscosity breaking	2-6
Rerun—pressed distillate	5
Heating liquid to 750° F.	5-8
Cracking, reforming and polymerization	5-8
Cracking—distilled or light oil	4.7-7.6
Cracking—residual or heavy oil	5.6-7.0
Rerun—Brightstock solution	7
Heating, no vaporization	7-10

Thus, wide ranges of velocity are permitted but of course each velocity produces a different pressure drop. A Refiner's Notebook on pressure drop will appear in about 3 months.

Outside diameter and wall thickness are fundamentally dependent upon the strength of the tube material (see Table 2) at the elevated temperature of the tube wall but internal corrosion and external scaling are so important that the strength of the tube material is of little practical significance. Nevertheless, Table 2 indicates minimum wall thicknesses for various tube sizes, materials, internal pressures, and wall temperatures.

The tube-wall thicknesses are conservative because they are based on creep stresses which allow only 1 per cent creep in 100,000 hours (11 years, 5 months). The strength formula of Harrington, Northrup, and Rhys, Sr., from "Cracking-Coil Tubes at War . . ," Pet. Refiner, pg. 161, November 1943, was used

$$t = \frac{RP}{1.2f}$$

in which t is tube-wall thickness, inches; R is external radius, inches; P internal pressure, psig.; and f is allowable metal stress, psi.

Values of f, the allowable metal stress, were published in The Refiner's Notebook No. 115 of October 19 entitled, "Creep Strength." Suitable values can be selected and used in the tube-thickness formula.

Corrosion and Scaling

Each oil and each furnace condition behave differently with respect to corrosion and scaling and hence nothing definite can be stated about the extra wall thickness to allow. Nevertheless, thinning by corrosion ranges from 0.015 to as high as 0.25 in. per year, and it should be noted that the extra thickness and the rate at which it disappears governs the length of the useful life of the tube. In severely corrosive conditions the chromium alloy materials of Table 3 are employed. Chromium contents of 2 and 5 per cent are frequently justified and high sulfur crude oils require steels up to 13 and even 18 per cent chromium.

TABLE 2—APPROXIMATE MINIMUM WALL THICKNESSES OF PIPE-STILL TUBES, INCHES

	0.15 Carbon Steel			5 Cr.-0.5 Mo. Steel			18 Cr.-8 Ni.-3.0 Mo. Steel		
	800°F.	900°F.	1000°F.	900°F.	1000°F.	1100°F.	1000°F.	1100°F.	1200°F.
4-in. o.d. tube:									
300 psi.	.04	.06	.24	.03	.07	.21	.03	.06	.10
600 psi.	.08	.12	.48	.07	.14	.42	.07	.12	.20
900 psi.	.11	.18		.10	.21	.63	.10	.17	.30
5-in. o.d. tube:									
300 psi.	.05	.07	.30	.04	.08	.26	.04	.07	.13
600 psi.	.09	.15	.60	.08	.17	.52	.08	.14	.25
900 psi.	.14	.22		.13	.26		.13	.22	.37
6-in. o.d. tube:									
300 psi.	.06	.09	.36	.05	.10	.31	.05	.09	.15
600 psi.	.11	.18	.72	.10	.21	.63	.10	.17	.30
900 psi.	.17	.27	..	.15	.31	..	.16	.26	.45

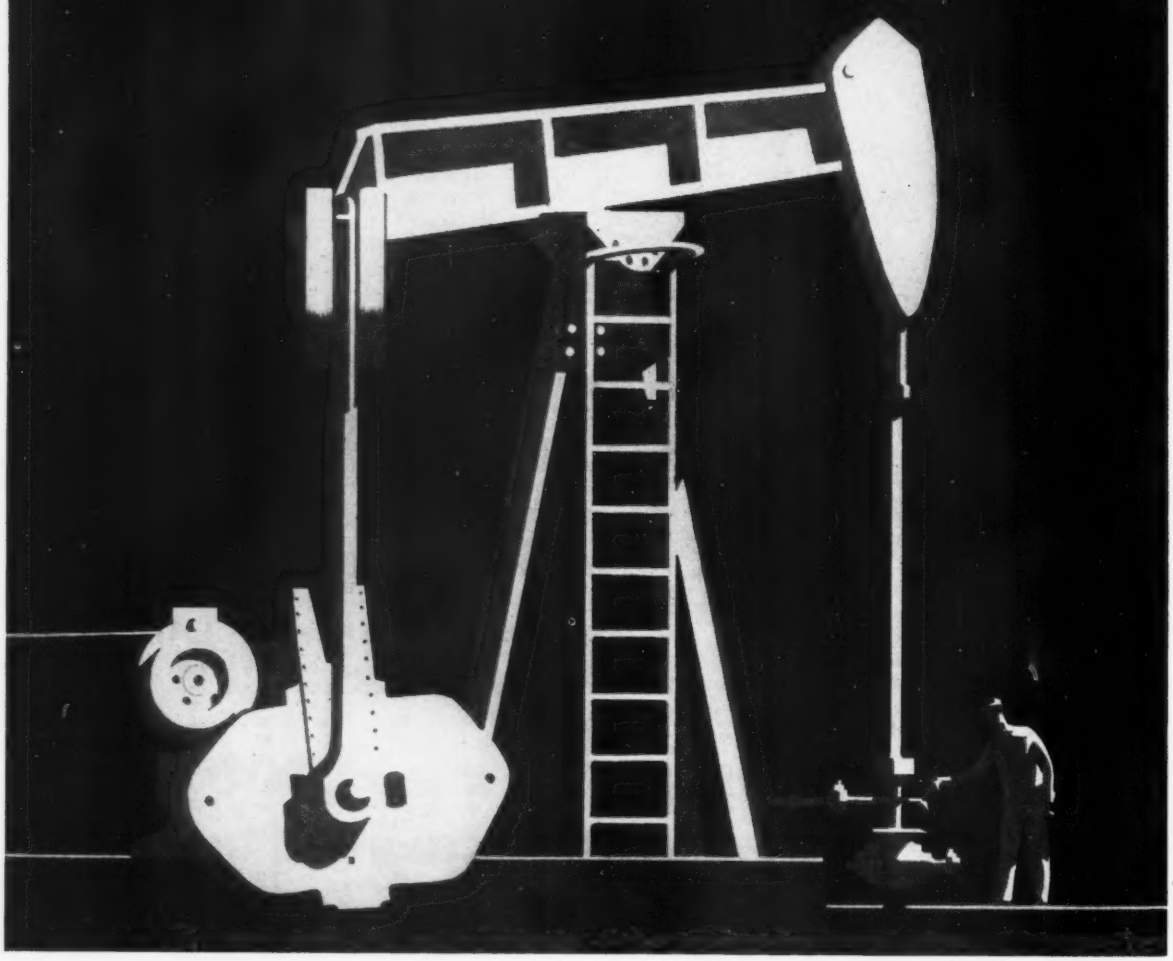
TABLE 3—COMPARATIVE COSTS, SCALING AND CORROSION LOSSES, AND STRENGTH OF TUBE STEELS

	Approximate composition, per cent			Relative to carbon steel			Design strength creep of 1% in 10,000 hrs. at 1,000° F.
Steel—	Cr	Si	Mo	Penetration by scaling	Penetration by sulfide	Cost	
Killed carbon	0	0.2	...	100	100	1.0	4,000
Carbon moly	0	0.3	0.5	113	61	1.5	12,000
Silicon moly	0	*1.5	0.5	73	59	1.6	6,400
1.25 Chrome moly Si	1.25	*0.75	0.5	77	62	1.9	18,000
2 Chrome moly	2.0	*0.5	0.5	70	47	2.1	9,300
2 Chrome moly Si	2.0	1.25	0.5	29	44	2.2	9,000
5 Chrome moly	5.0	*0.5	0.5	48	33	3.3	10,000
5 Chrome moly Si	5.0	*1.5	0.5	6		3.5	7,000
5 Chrome moly Si-Al	5.0	*.75	†0.5	3	30	3.6	7,600
7 Chrome moly Si	7.0	*.75	1.0	2	25	3.8	
9 Chrome moly	9.0	.40	1.0	6	23	5.3	9,000
13 Chrome moly	13.0	.40	1.5	4	18	7.3	11,000
18-8 Chrome nickel	18.0	*.75	(‡)	1	5	11.0	17,000

*Maximum. †And 0.5 per cent Al. ‡8.0 per cent Ni.

No. 116 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

Molybdenum steel polished rods give long, economical service on pumping jobs.



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QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Waste Heat Boilers

Simplified Flow Diagrams

How can we save the heat in the flue gases from our cracking plant? —A.F.C.

Such heat can be saved by means of what is known as a waste-heat boiler. The idea is a tempting one because it appears that heat is being obtained at no cost. Actually such boilers are much less efficient than regular boiler installations. When properly installed the square feet of tube surface required ranges from 9 to 16 for the generation of 1 b.hp. whereas only 3 to 7 sq. ft. is provided in most boilers (including heated shell). This question was answered previously on the Questions on Technology page of March 31, 1945, and there is no doubt that the installation of such boilers is expensive. Nevertheless, they are economical over a long payoff period, particularly if the flue gases are at a very high temperature. The tubes tend to become fouled with scale.

There are several sources of high-temperature flue gases such as thermal cracking, thermal polymerization, polyversion, gas reversion, catalyst burnoff, or vacuum plants. If a waste-heat boiler is contemplated at the time such plants are designed it is economical to design for even a higher than normal flue-gas temperature because the last heat can be removed from the gases by means of a waste-heat boiler more cheaply than by a larger convection in the pipe still.

In addition to heat removed from flue gases it is also usually economical to heat the boiler feedwater with some high-temperature stock as indicated in the flow diagram on this page. The feedwater is normally heated to 150°-250° F. by means of exhaust steam but it can be heated to almost boiler temperature by also utilizing hot oil streams.

Obviously a waste-heat boiler should be operated at the lowest pressure that can be used in the refinery because a low steam temperature permits large mean temperature differences for the preheater and for the boiler itself. Boiler temperatures versus pressure are:

80 psig.	298° F.
100 psig.	316° F.
140 psig.	345° F.
180 psig.	366° F.

An excellent reference is "Generation of Steam as a Factor in Modern Refinery Economy," by Kraft, Mekler & Riemenschneider in The Oil and Gas Journal, page 110, May 22, 1941.

Lubricating Oil Storage And Handling

We are installing two horizontal pressure tanks for storing 2,500 gal. lubricating oil for our compressor station. Dry natural gas is to be used to blanket the oil in the tanks at a pressure of 7 psig. About 50 gal. of oil per day will be withdrawn and we plan on keeping the oil at 90° F. for ease in handling. The question is "Will the natural gas harm the oil in any way?"

Unless there is definite reason to expect deterioration with this particular oil, it is not necessary to employ the gas blanket suggested in the question.

The rate at which oxidation or discoloration occurs in lubricating oils, according to William G. Forbes, (Lubrication of Industrial and Marine Machinery, John Wiley & Sons, N.Y.), is doubled by each rise in temperature of 15° F. However, this information is based on the behavior of lubricating oils at temperatures above 140° F. when used in oil-circulating cooling systems, and the rate of oxidation is not really rapid until the temperature exceeds 180° F. Thus, it would not be expected that properly treated lubricating oils would deteriorate at 90° F. even during 2 months or more storage.

Lubricating-oil storage tanks should be fitted with all-iron valves, fittings, and connections because copper, zinc, lead, and copper-base alloys tend to catalyze the oxidation of lubricating oils. Ordinarily such precautions are not necessary in regular storage tanks, but if the oil is aerated at an elevated temperature it is advisable to avoid the catalytic metals. Galvanized-zinc containers are generally avoided even in cans or containers.

Heavy-Duty Oil

If the oil is of the heavy duty type now utilized almost exclusively for diesel engines, the presence of moisture may cause the additive to be precipitated, particularly additives of the sulfonate type. Thus, condensation of moisture on the walls of the tank or container should be avoided. No easy way of preventing the condensation of moisture presents itself unless perhaps it be one of the following methods:

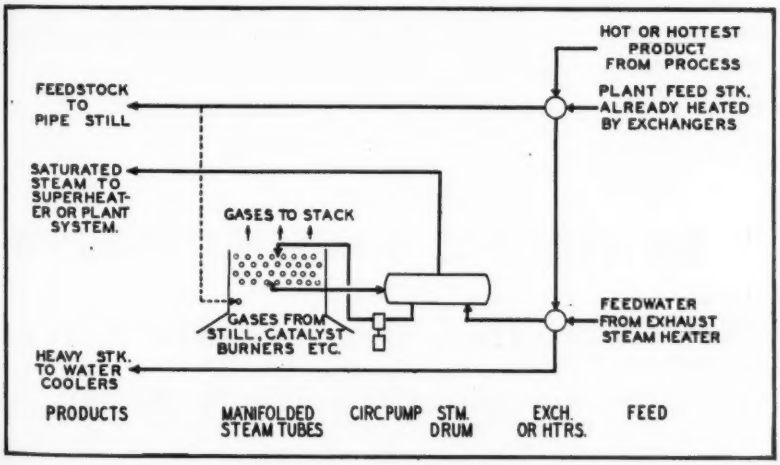
(1) Keep the tank sealed from air.

(2) Blanket the oil with inert gas such as dry natural gas or nitrogen.

(3) Keep the oil at a constant temperature by keeping it in a building.

(4) Keep the oil at 90°-100° F. by means of closed steam coils so that the air that may be sucked into the tank will be warm. In nearly all situations this will result in a decrease in the percentage humidity of the air.

Finally, foreign material such as dirt, pipe scale, etc., must be guarded against. If the plant organization can be depended upon to periodically check and drain out sediment through a bottom drain, the best arrangement is to withdraw oil at 6-10 in. from the bottom of the tank. Unfortunately, bottom drains tend to become plugged or they are not checked and hence it is probably best average practice to withdraw oil from the bottom of the tank.



Simplified flow diagram of waste-heat boiler

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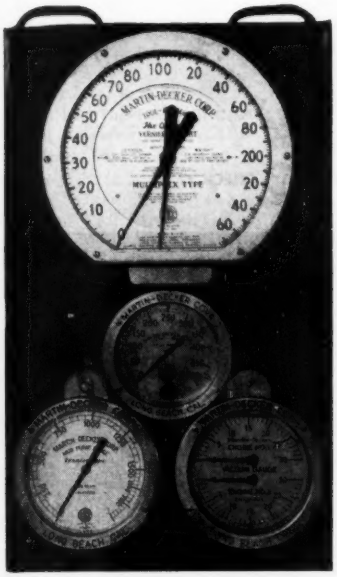
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

by Kenneth B. Barnes



(1) CLIPPER SEAL-TITE weight indicators are installed at driller's position. Protects the gage mechanism from the terrific whip and vibration occasioned by deadline mounting. Permanent sealing at the factory eliminates leaks, pumping up or refilling, enables instrument to remain connected even during transportation and storage. Nonfreezing, noncorrosive fluid. Available in several combinations. *Martin-Decker Corp.*

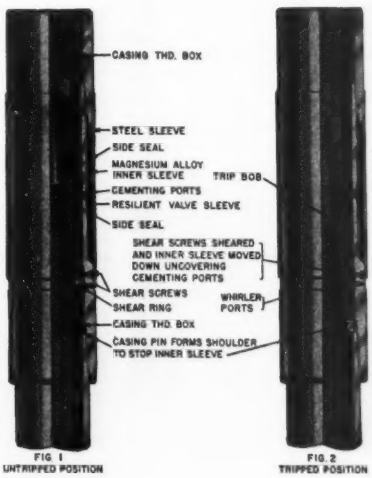
IT'S NEW CHECK IT

(2) "NAVION" is new all-metal four-passenger airplane for the civilian pilot, from the builders of the famed P-51 Mustang, B-25 Mitchell, and AT-6 Texan. The side-by-side dual-control airplane has a cruising speed of 150 m.p.h., maximum range of 700 miles. Specially designed wing gives unusual aileron control at low speeds; a power retractable tricycle landing gear with a 20°-degree steerable nose wheel makes for easy handling on the ground. Full-vision canopy. There is a separate luggage compartment; the back seat may be removed to accommodate 435 lb. more. There is an electric starter, navigation lights, variable-pitch propeller. *North American Aviation, Inc.*

IT'S NEW CHECK IT

(3) PNEUMATIC HAMMER features hand-fitting grip and controllable speed. An air-throttling regulator valve permits fine adjustment to accommodate all kinds of riveting. It can be used, with other tools, for caulking, scaling, chipping, etc. A beehive retainer spring is easily screwed on. *Ideal Commutator Dresser Co.*

IT'S NEW CHECK IT



(4) MULTIPLEX CEMENTING COLLARS perform multistage cementing jobs without use of an auxiliary cementing string or special running-in tools. The cementing collar with steel sleeve is provided with a number of cementing ports. Acting as a back-pressure valve is a resilient rubber valve sleeve reinforced with bias canvas and protected by

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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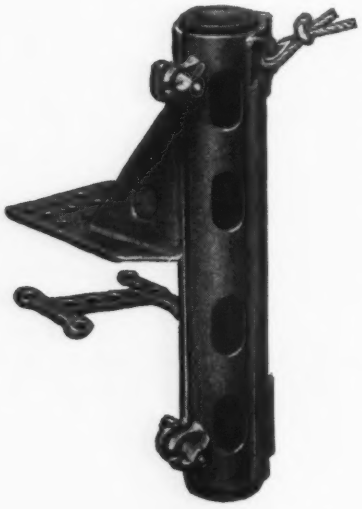
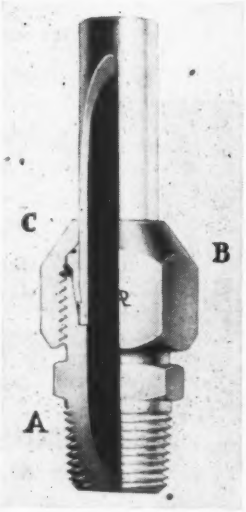
a steel sleeve. Collar contains drillable magnesium-alloy inner sleeve held in place with shear screws to cover the cementing ports until released by the weighted trip bob. *Baker Oil Tools, Inc.*

IT'S NEW CHECK IT



(5) DEADLINE STABILIZER does not bend line, allows freedom of movement with absolutely no wear to the line. Prevents whip that may be destructive to weight indicators. Line failure at the finger board is eliminated. Obtainable in two and four-section types. *Patterson-Ballagh Co.*

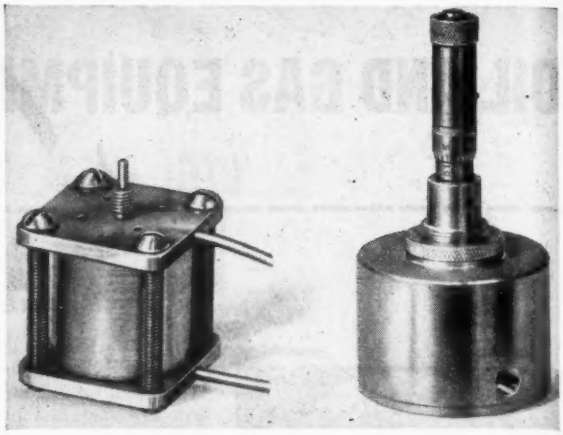
IT'S NEW CHECK IT



(6) NEW FLARELESS FITTING joins all types of metal tubing. Special flaring and assembly tools not required. Particularly useful in high-pressure applications and where thick wall tubing is used. When body "A" and nut "B" are tightened, the confined ferrule "C" is forced forward. The cone angle of the body contacts the ferrule, directs its sharp forward edge downward. Reduction of section in the leading edge of ferrule permits deflection to afford good camming contact. Casts up a shoulder to resist pullout when pressure is applied in the system. *The Parker Appliance Co.*

IT'S NEW CHECK IT

(7) MICROMETER VALVES give precise flow control for liquids and gases. Uses a basically new principle; 600 in. of capillary passage are enclosed in a metal container 1½ in. square. Flow control is obtained by moving the adjustable plunger, thereby varying the length of the capillary passage continuously from 4 to 600 in. Withstands vibration and mechanical abuse; made of noncorrosive metals. Valve on the right is a laboratory test model with precise micrometer adjustment, demonstrating the principle of operation. *Standard Instruments Co.*



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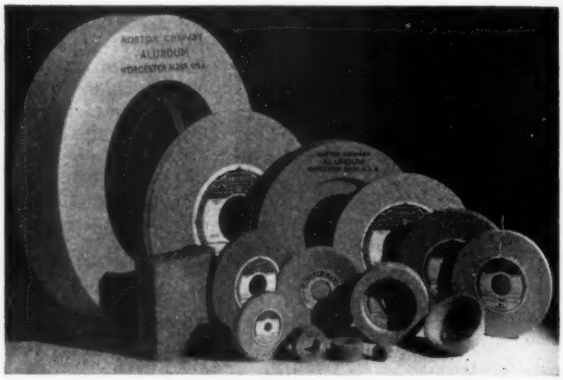
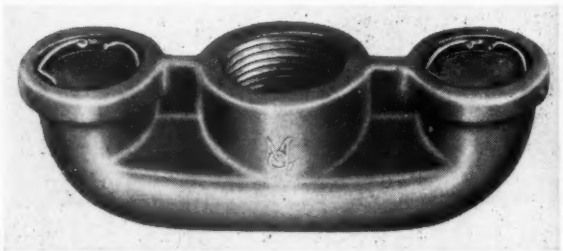


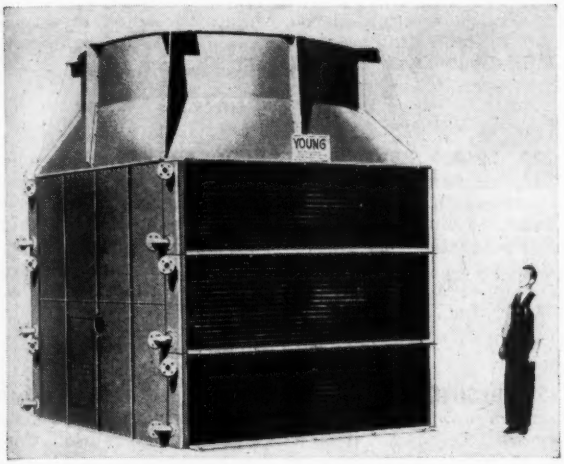
(8) ABRASIVE ALUMINUM OXIDE is known as 32 Alundum. Made by an electric-furnace process which produces each grain as a complete, single crystal. The grains do not require any crushing to size, but have a chunky, nubbly shape. Tests show grinding wheels of this material have a faster and cooler cutting action, require fewer dressings. *Norton Co.*

IT'S NEW CHECK IT



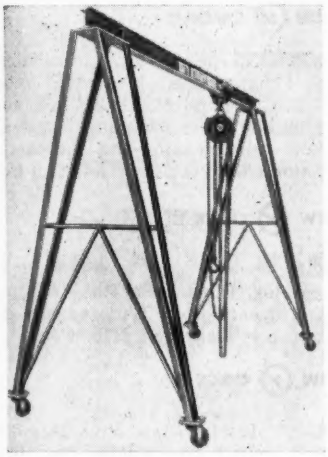
(9) VENT FITTINGS for underground oil and gasoline storage tanks are equipped with screens. These prevent entrance of heavy particles of dirt into the vertical pipe. Screens are reinforced around the edge with a sheet brass frame, are retained by a cadmium plated steel snap ring. Has a number of other applications. *The Pyle-National Co.*

IT'S NEW CHECK IT



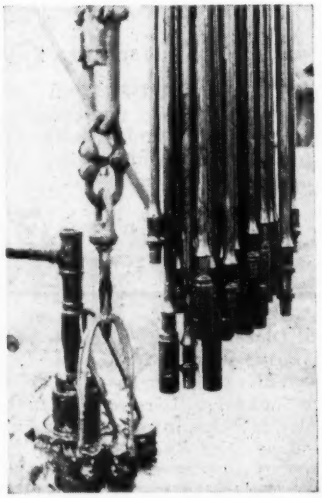
(10) LARGE-CAPACITY RADIATORS for cooling and condensing are designated as VAD units. Ranges upward from 3,600,000 B.t.u. per hour. For water, oil, and gas cooling, steam and vapor condensing. Induced draft obtains air distribution, eliminates recirculation and cross-wind effects. Coils mounted in vertical plane for economical installation, easy maintenance. Simplified manifolding; low level mounting. *Young Radiator Co.*

IT'S NEW CHECK IT



(11) NEW GANTRY CRANE is of 1-ton capacity, has generous safety factor and minimum gantry weight. It has a broad variety of uses at loading platforms and docks, in plants, machine shops, garages, construction work, and maintenance. The design features portability, ease in handling and flexibility. *Industrial Equipment Co.*

IT'S NEW CHECK IT



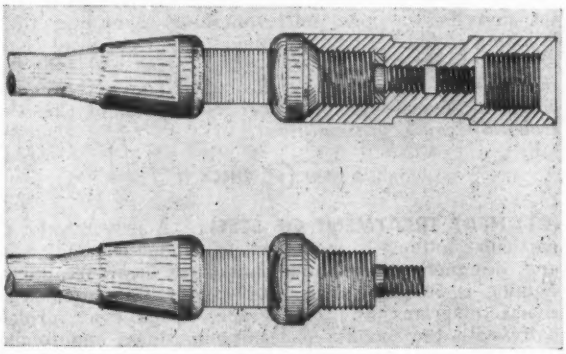
(12) "K" MONEL SUCKER RODS, developed for pumping of corrosive wells, have established outstanding records in applications such as exemplified by that in the Howard Glasscock pool of West Texas. Here, one test string installed in 1941 (in a well where previous rod strings were completely replaced every 5 months) has operated continuously without a single break or shutdown due to rod failure. The photo gives inspection view at the end of 1,471 days of continuous service. Monel is an alloy of two-thirds nickel and one-third copper. The "K" Monel represents addition of 2¾ per cent aluminum and makes an age-hardenable alloy with physical properties superior to many alloy steels. *W. C. Norris, Manufacturer, Inc.*

IT'S NEW CHECK IT

(13) NEW DRILL-PIPE WIPERS are made in both replaceable-insert and one-piece types. On the first, when wear or damage from tool joints or other factors make the wiper ineffective, the operator need only replace the worn insert. A tapered center hole provides high wiping efficiency and long life, as does also the raised center hub. Radial ribs are incorporated to strengthen wiper yet allow easy stretch. *Baroid Sales Division, National Lead Co.*

IT'S NEW CHECK IT

(14) NONPARTING SUCKER ROD (Johnson streamlined) offers new design features. Among the advantages claimed are: (1) These rods will not come unscrewed. A special lock washer, permanently fitted within the box,



creates a "pressure lock" at the end of the pin end. This "jam" is counter-opposed by a similar jam at the taper present at the make-up shoulders; (2) the rods will not unscrew without wrenching, preventing breaks of the thread pins due to wobbling; (3) reinforcements are incorporated behind the rod wrench square; (4) tubing wear is prevented due to streamlined body of rod joints. *Johnson Oil Well Equipment Co.*

TRADE LITERATURE

(15) DRILLS—HOW TO SHARPEN THEM. A 24-page manual on the correct principles of sharpening twist drills. Manual contains detailed data on proper care and gives dimensions and angles of proper points for best

results in drilling various materials. *Republic Drill & Tool Co.*

IT'S NEW ✓ CHECK IT

(16) VALVES AND METERS. July-August issue of "The Flow Line" illustrates line of valves and meters. Among features in the issue is a description of a method of sampling oil at the well head whereby samples are continuously removed from the oil in minute quantities and measured in its original state as it comes from the well. *Rockwell Manufacturing Co.*

IT'S NEW ✓ CHECK IT

(17) WATER-TUBE BOILERS. A new bulletin covers installations of water-tube boilers. Gives principal data and diagrams on each installation. Also shows details of furnace water wall construction by means of diagrams of four typical designs. *Henry Vogt Machine Co.*

IT'S NEW ✓ CHECK IT

(18) MOTOR-GENERATOR SETS. Eight-page bulletin describes line of alternating and direct current generator sets for producing electricity for light or power. Each generator is illustrated by photographs and described in some detail. *Century Electric Co.*

IT'S NEW ✓ CHECK IT

(19) VERTICAL CENTRIFUGAL PUMPS. New six-page bulletin describes design, construction, and application of three types of vertical centrifugal pumps. All are illustrated and include comprehensive parts diagrams. *Peerless Pump Division—Food Machinery Corp.*

IT'S NEW ✓ CHECK IT

(20) SYNTHETIC FLUID CRACKING CATALYST. Booklet describes a new microspheroidal synthetic fluid cracking catalyst. Lists advantages, gives chemical characteristics, chart on particle-size control and table of particle-size analysis. Also has graph on activity and chart on severity factor. *American Cyanamid Co., Petroleum Chemicals Dept.*

IT'S NEW ✓ CHECK IT

(21) HEAT TREATMENT OF STEEL. A new booklet of particular interest to metallurgists, production engineers, and designers gives fundamentals of heat treatment. Catalog is 54 pages and is effectively illustrated with charts, diagrams, and photographs. Book deals principally with the factors concerning hardness and toughness. *Carnegie-Illinois Steel Corp.*

IT'S NEW ✓ CHECK IT

(22) DIESEL TRACTOR. New 32-page catalog illustrates Diesel "crawler" tractor. Has photographs of tractor in action and cutaway views of important parts as well as stories on the "pusher" technique presented in a manner to interest all tractor people. Lists allied equipment. *Allis-Chalmers Mfg. Co., Tractor Division.*

IT'S NEW ✓ CHECK IT

(23) SPIRAL BEVEL SPEED REDUCERS. Spiral bound, 60-page catalog, punched for use in a three-ring binder describes in great detail a line of spiral bevel speed reducers. Gives procedure for selecting unit, table of load characteristics and service factors, horsepower ratings, dimensions, etc. Tables and blueprints are used profusely to fully cover the subject. *Philadelphia Gear Works, Inc.*

IT'S NEW ✓ CHECK IT

(24) RESINOUS CEMENT. Six-page, fold-out catalog describes an all-purpose acid and alkali proof resinous cement. Tells what it is, where and how it is used. Contains resistivity chart and installation pictures. *Nukem Products Corp.*

IT'S NEW ✓ CHECK IT

(25) FIRE SPRINKLER SYSTEMS. New 19-page bulletin illustrates manufacturer's line of automatic sprinkler systems. Cutaway drawings and diagrams show uses and construction details. *Automatic Sprinkler Corp. of America.*

IT'S NEW ✓ CHECK IT

(26) CHAINS AND SPROCKETS for power transmission and mechanical handling of material. An illustrated two-color digest catalog giving pertinent information on drive and conveying chains and sprockets, finished steel roller chains and sprockets, silent chains and sprockets, and flexible couplings. *Union Chain & Manufacturing Co.*

IT'S NEW ✓ CHECK IT

(27) TOOLS AND TONGS. Every style covered in a comprehensive 43-page catalog. Illustrated. Has description of parts and price list of each item. Wide variety of tools applicable to oil industry. *Gearench Mfg. Co.*

IT'S NEW ✓ CHECK IT

(28) OIL-FIELD POWER. Profusely illustrated 32-page brochure presents diesel, gasoline, and butane-operated engines for oil field and other uses. Has typical installation views accompanied by description; also gives specifications. *Waukesha Motor Co.*

IT'S NEW ✓ CHECK IT

(29) OIL-WELL DRILLING. An 18-page catalog containing over 20 field photographs of manufacturer's mobile rotary drilling units, well-servicing hoists, and telescoping derricks. Information contained includes design, operation, and specifications. *Wagner-Morehouse, Inc.*

IT'S NEW ✓ CHECK IT

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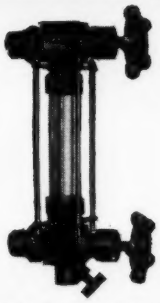
PENBERTHY

"ALL IRON"

LIQUID LEVEL GAGES



Body made from a special high strength alloy iron, shanks alloy steel and trim stainless steel. Extra heavy construction throughout, automatic and positive shut-off if glass breaks, heavy duty stuffing boxes. Conform with A.P.I.—A.S.M.E. requirements.

The "All Iron" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.

DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

THAT "COMPLETE PACKAGE" REFINERY INTERESTS ME!

SEE PAGE 58

HARRISBURG *Oil-Field* PRODUCTS

Seamless Steel COUPLINGS

Made to A.P.I. Specifications

Harrisburg's 25 years' experience and carefully controlled inspection result in a Coupling of a superior type. The threading operation is fully as vital a contribution to the superiority of Harrisburg Couplings as is the fact that they are made from our own steel. Harrisburg Couplings are threaded by a special process designed and perfected by our engineering staff, and these threads are unexcelled in accuracy of form, height, angle and lead. Due to these threads, Harrisburg Couplings will not gall under the severest strain.

Specify these units and see how Harrisburg's special steel and machining methods have achieved this superiority.

Drop-Forged Steel FLANGES

Made to A.S.A. Standards

Harrisburg Drop-Forged Steel Flanges are noted for their strength, endurance and accuracy of machining. These flanges not only have a wealth of extra ruggedness but their threads are so carefully machined that they will stand any test as to fullness and uniformity. The threads of Harrisburg Flanges are perfect in height, angle, taper and gauging. A complete line of Harrisburg Flanges in standard type or for special purposes is available.

HARRISBURG STEEL CORPORATION

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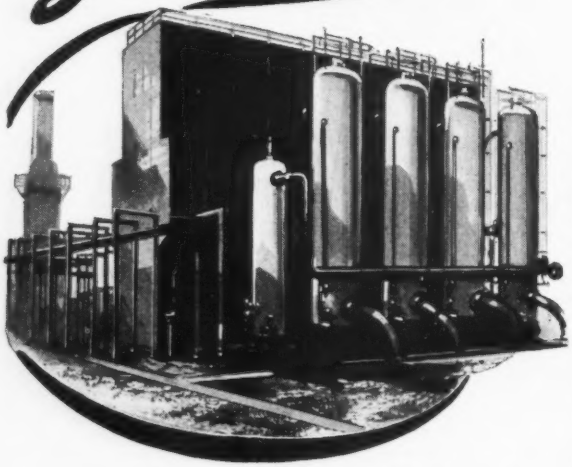
Alloy and Carbon Steels; Seamless Steel CO_2 Liquefiers, Pipe Couplings, Slush Pump Liners and High Pressure Gas Cylinders; Drop Forgings; Forged Steel Pipe Flanges; Coils and Bends

IN THIS

EFFICIENT DRYER
THE DESICCANT IS

Florite*



Natural gas is dehydrated by the use of Florite in this modern plant of an important company operating in the Southwest.

Made from bauxite by special processes of activation and mechanical adaptation, regenerated by heating to 350°F., Florite is superior to other granular desiccants for many and varied industrial uses. Dehydration of natural gas, represented by the illustration above, is one example. Hydrofluoric alkylation of aviation gasoline is a quite special example. Propane, butane, air, nitrogen, carbon dioxide, refrigeration compounds, and various other fluids are successfully and economically treated. Some of these uses have been established for years. New ones are developed from time to time. Correspondence is invited.

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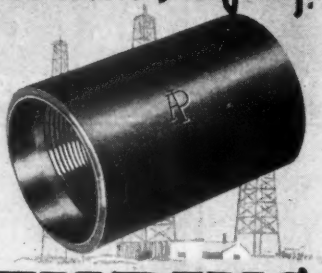

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You can always be sure of tight, trouble-free joints when you specify "X-L" Quality Couplings. Available in Plain or External Upset for standard tubing. Made from steel. Tested by Comparator to assure strict adherence to A.P.I. standards.

When ordering, please use our catalog description; it will save time and error.

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Low Cost Electricity with

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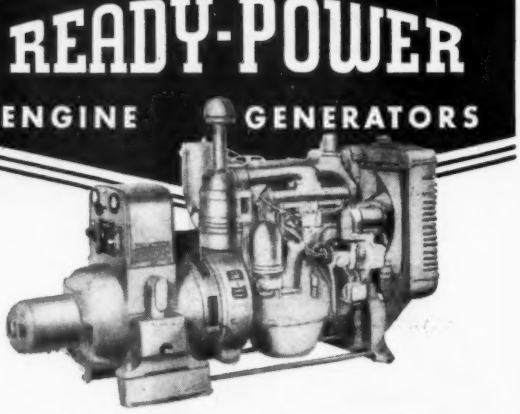

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REFINING

Colorado Refinery Reported Considered by Cooperative

Construction of a 3,500-bbl. daily capacity refinery at Grand Junction, Colo., and a pipe line from Rangely field is being considered by Cooperative Refinery Association, it was reported last week.

The refinery as studied by the organization would cost about $1,500,000, and the pipe line about $750,000. At present, production in Rangely field is limited to the capacity of Stanolind Pipe Line Co.'s line. There are now 10 operators in the rapidly developing field.

The Cooperative Refinery Association now operates two refineries, one at Phillipsburg, Kans., of 4,200 bbl. daily crude capacity, and a second at Coffeyville, Kans., of 11,000-bbl. daily crude capacity. The association is a subsidiary of Consumers Refinery Association.

Frontier Seeking to Buy U. S. Plant in Cheyenne

DENVER.—Frontier Refining Co. is now negotiating with War Assets Administration for purchase of the Government's $6,000,000 aviation-gasoline plant at Cheyenne, Wyo.

Disclosure of the negotiations was made by M. H. Robineau, Frontier president, at the annual stockholders meeting of the company. Frontier operated the plant during the war. The Cheyenne property includes 2,700 bbl. daily fluid catalytic cracking capacity, 1,100 bbl. daily HF alkylation production, and 450 bbl. daily isomerization production.

Robineau told the stockholders that the government plant must be obtained at a favorable price.

Frontier's Cheyenne refinery has been enlarged by a newly completed $900,000 road oil and asphalt plant. Robineau, in his report to the stockholders, said crude runs at the Cheyenne refinery during the 12 months ended September 15 averaged 5,012 bbl. daily, considerably higher than in any prewar year.

Phillips Products Held Suitable Reference Fuels

BARTLESVILLE.—Manufacture of both components of the primary reference fuels, normal heptane and isooctane (2,2,4 - trimethylpentane) in commercial quantities and of purities satisfactory for use as these all-important knock - testing fuels has been announced by the chemical-products department of Phillips Petroleum Co. Both products have been tested by the National Bureau of Standards at Washington, and the bureau laboratory has stated that "the physical constants and knock tests of the sample(s) indicate that this material is suitable for use as one constituent of the primary standard of reference in knock testing." Each product shows a purity of more than 99 mol per cent of its main constituent.

Sunray Completes Treating Plant at Santa Maria

Construction has been completed on a $100,000 central treating plant at Sunray Oil Corp.'s refinery at Santa Maria, Calif., according to F. L. Martin, vice president in charge of refining.

Designed to remove water, salt, and base sediment from crude from nearby Santa Maria field, the system includes two 25,000-bbl. storage tanks, four Petreco desalting units, a Millard heating unit, a concrete skimming pit and other items of equipment.

Decline Listed in Stocks Of Gulf Coast Products

HOUSTON.—Stocks of all products except kerosene showed decreases during the last half of September in plants of member-company refineries

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DROP FORGED STEEL
LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures and/or temperatures. Construction exceptionally sturdy. Made of alloy temperature resisting steel, and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

The "Transparent" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

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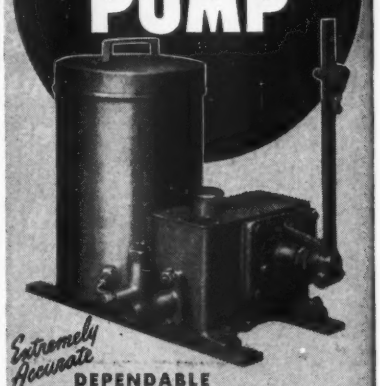
McCORD
TYPE "C"
CHEMICAL MEASURING
PUMP



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DEPENDABLE

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Standard of the Oil Fields
McCORD
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of the Gulf Coast Refiners Association, according to the organization's semimonthly report.

Reporting on operations of member-company plants on the Texas Gulf Coast, the association said total stocks of all products were 4,253,692 bbl. October 1, as compared to 4,670,946 bbl. September 15. Stocks of all grades of gasoline and naphthas, mostly automotive motor fuel, dropped 133,464 bbl. and were reported at 1,382,928 bbl.

Kerosene stocks showed a gain during the period of 3,501 bbl. to 256,158 bbl. Diesel gas-oil stocks October 1 were 115,071 bbl., a drop of 31,731 bbl. Stocks of No. 5 dropped 40,016 bbl. to 444,591 bbl., and Bunker C, 200,902 bbl. to 366,108 bbl.

The association said crude runs to stills during the period averaged 94,161 bbl. daily, and were at 65 per cent of the rated 145,000-bbl. daily operating capacity.

International Rubber Control to End January 1

A free market for rubber, bringing the likelihood of stiffer competition for America's petroleum-based synthetic industry, has been brought closer by the announcement of the British Board of Trade that all international controls would be removed January 1, 1947.

In New York, spokesmen for the rubber industry held hopes that rubber will be freed from all restrictions within 6 months, pointing out at the same time, however, that the dropping of U. S. Government controls could not end before next April if then. Such action, they said, depends of government stockpiling plans, rehabilitation of the Far East natural-rubber industry, and production costs as between natural and synthetic.

In London, the Board of Trade said governments on the combined rubber committee agreed to end controls "in view of increased quantities of natural rubber becoming available for international allocation." The committee will be disbanded.

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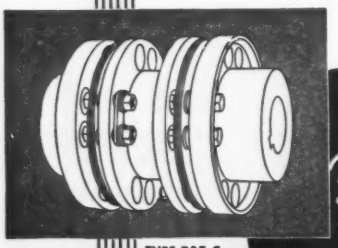
FOR HOT OIL PUMP DRIVES or any other service where 100% dependability is demanded



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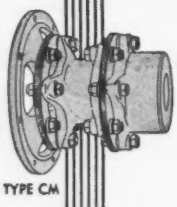

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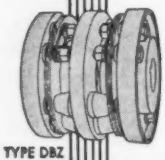

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WARREN, PENNSYLVANIA

Adequate Butyl-Rubber Supply Seen Next Year

NORMAN, Okla. — United States' capacity for production of butyl rubber will be great enough to supply our normal replacement requirements for motor tire tubes, by about the first of 1947, J. A. Britton, Jr., head of the rubber division of Stanco Distributors, Inc., told the Mid-Continent section of the Society of Automotive Engineers here recently.

By that time, American butyl-rubber factories will be producing at the rate of about 90,000 tons per annum, Britton said. This capacity is in three plants, and agrees fairly well with the requirements for tubes which have been estimated at between 80,000 and 105,000 tons of tube rubber annually.

Butyl rubber is a distinctive type of synthetic rubber, much less unsaturated chemically than other types of rubber, the speaker said. A whole new technology was developed before butyl rubber became a commercial success, he added. It is made at temperatures of —150° F., in present operations.

Canadian Refinery Expands

VANCOUVER, B. C.—A $1,500,000 addition to the Shell Oil Co. of British Columbia refinery at Shelburn, on Burrard Inlet, will be in operation in November, G. L. Gardiner, refinery manager, has announced. Besides increasing the present capacity of 4,200 bbl. a day, the new plant embodies cracking processes by which engineers can alter the quantities of gasoline, kerosene, and other products obtained from the crude. Features of the new plant are oil-burning furnaces capable of producing temperatures up to 800° F. and a polymerization unit. The plant will continue to operate on California crude.

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4. **Chemical costs are substantially reduced**
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Savings over outmoded sweetening methods are large enough to make Perco Copper Sweetening an attractive investment. Facts and figures are available without obligation.

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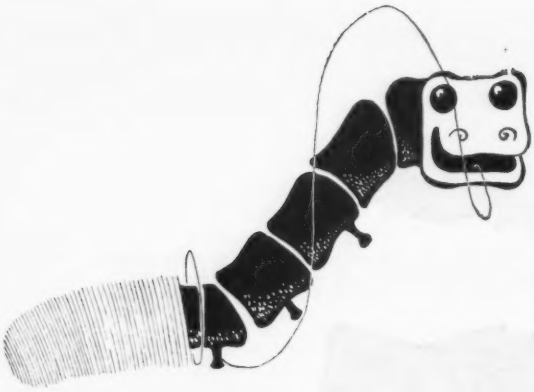

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At Union Chain we eat and sleep sprocket chains and nothing else. In particular we concentrate on Oil Field Chains for every application. Let **specialists** go to work on your power transmission problems.

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Exclusive Davis Dia-Ball packless, leak-proof transmission unit for improved trouble-free operation. Sensitive, accurate control of liquids with Davis Straightlined Power. Literature on request. Write today.

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A Wide Range of Sizes and Capacities
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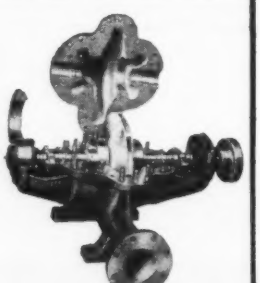

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PIPE LINES

Magnolia Contracts Loops For Seeligson Pipe Line

Magnolia Pipe Line Co. has awarded contract to J. R. Horrigan Construction Co. for laying 35 miles of 8-in. to loop the company's Seeligson-Corpus Christi line.

Work will start early next week, according to J. L. Latimer, president of Magnolia Petroleum Corp. Pipe is being shipped from Oklahoma where Bishop & Lock Construction Co. has contracted taking up 40 miles of 8-in. between Maud and Stonewall.

Pasotex Lets Contract For Iraan-Wink Line

Pasotex Pipe Line Co. has let a contract to Smith Contracting Co., O. R. Smith, managing partner, for laying 98 miles of 10¾-in. crude-oil line from Iraan to Wink in West Texas, according to M. P. Paret, Jr., vice president.

Pipe is being shipped from the mill. Construction will start immediately and will be completed before spring. The contractor will operate with one spread.

The line will be Somastic coated for its entire length. Coating operations will be handled by H. C. Price Co.'s Somastic division; one plant will be used which will be installed at two settings: Wickett and McCamey.

Sun Reconditions Line Near Syracuse, N. Y.

Sun Pipe Line Co. is finishing reconditioning and coating 16 miles of 6-in. in the Tully Valley between Portland and Syracuse, N. Y. All work is being done over the ditch while the line remains in service under pressure.

In addition to this project, H. C. Price Co., Somastic division, is handling others in various parts of the country. At Minneapolis it is completing coating of 27 miles of 8 and 10-in. for Standard Oil Co. (Ind.) This week it starts coating 15 miles of 12¾-in. for the combined project of United Gas Pipe Line Co. and California Co. at the Crown Point, La., gas system. At San Antonio, the division is handling more than 20 miles of 4½-in. for Carbide & Chemical Co. and approximately 12 miles of underground electric cable for General Electric Co.

Socony-Vacuum Completing Pennsylvania Products Line

Construction work is nearing completion for laying 200 miles of 8-in refined products pipe line between Huntingdon, Pa., and Pittsburgh, for Socony-Vacuum Oil Co., Inc. The project has been handled by O. C. Whitaker Co.

The Whitaker company is also laying between 60 and 70 miles of gathering lines of diameters from 6 to 20 in. in the Carthage, Tex., area.

British American Subsidiary Buys North Texas System

DALLAS.—Bell Oil & Gas Co. has sold its gathering system in the Petrolia shallow area of Clay County. North Texas, to Toronto Pipe Line Co., subsidiary of British American Oil Producing Co., it was announced

WHEN YOU WANT The Best IN PIPELINE CONSTRUCTION

OKLAHOMA CONTRACTING COMPANY

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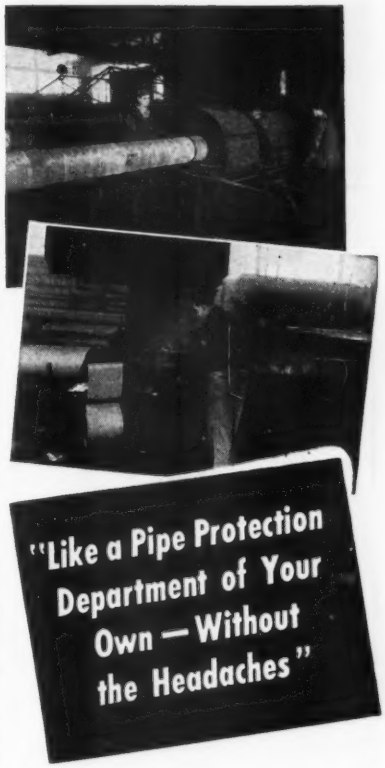
CARACAS, VENEZUELA



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When you give Pipe Line Service a job of coating and wrapping pipe, you have the close cooperation that you'd expect only from a department of your own, without any of the headaches of equipment and personnel.

These experienced pipe protection specialists offer you a complete service at six strategically located plants that relieves you of all responsibility. You simply select the specification you want and Pipe Line Service does the rest.

Find out today how much *more* Pipe Line Service gives you for your pipe protection dollar.

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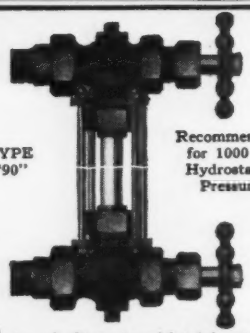
DROP FORGED STEEL
LIQUID LEVEL GAGES



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Made of Chromium-Molybdenum alloy temperature resisting steel, extra heavy throughout and stainless steel trimmed. Positive automatic shut-off; stainless steel balls shut off the flow of liquid if glass breaks. Regrinding removable seats, heavy duty stuffing boxes, union connections. Conform with A.P.I.—A.S.M.E. requirements.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

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Pipeline PERFECTION

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GENERAL PIPELINE CONTRACTING
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last week. The system consists of about 100 miles of 2 and 4-in. pipe line and is said to be the oldest in North Texas.

Originally constructed by The Texas Co., the line currently serves some 280 stripper wells and handles about 150 bbl. of oil a day. Toronto will route its crude runs through the Texas line to Henrietta, Tex., and from there to British American's refinery at Moose Jaw, Canada, by tank cars.

Continental to Recondition Line Near Valley Center

Continental Pipe Line Co. will issue specifications within 30 days for reconditioning of 40 miles of 8-in. crude-oil pipe line in the Valley Center, Kans., area, according to A. C. Wilkinson, vice president and general manager.

The company has completed arrangements for procuring coal-tar enamel, asbestos felt, and the new pipe required. The plan under consideration is to keep the line in continuous operation. To do this, a section of 5 or 6 miles of new pipe will replace an equal section of old pipe removed from the line to a temporary yard where it will be cleaned, spot-welded, double-jointed, patched, half-soled, coated, and wrapped preparatory to relaying to replace other old pipe removed further up the line. It is expected that the work will start before the end of this year.

Gas Industrial Prepares To Lay Monterrey Line

Gas Industrial, S. A., Monterrey, Mexico, is preparing for the construction of a 135-mile 14-in. natural-gas pipe line from Reynosa, at the United States' border on the Rio Grande River, to Monterrey. If final approval of the project is given by the Federal Power Commission in the meantime, work will start early in 1947, possibly the middle of January. Gas Industrial, S.A., has been financed by glass, cement, brewery, and steel interests of Monterrey.

Gas is to come from La Gloria Corp. in Texas. Pressure at the border, it is reported, will be high enough to permit transmission to Monterrey without the need of compressor stations. It is expected the pipe will be coated and a glass mat wrapping applied.

Construction work would start at the Monterrey end. Laying operations are to be handled by Contratistas del Norte, S.A., an affiliate of O. C. Whitaker Co., according to reports, with operations directed by J. C. Minyard, general superintendent, and Merle Tatum, spread superintendent. Right-of-way for the line in Mexico has been acquired.

Underground Lines Survived Hiroshima Bomb Blast

"Oddly everything even a few feet underground, including utility service lines, was safe," said Roger W. Babson, statistician and investment counselor, in Tulsa last week in discussing conditions observed by his investigator sent to Hiroshima and Nagasaki for a 3 months' study of damage done to these two cities by the atomic-bomb explosions.

His primary objective was to learn "what damage had been done to private fortunes which is my business," Babson said. The investigator "found that these were hopelessly tangled up because all depositories where business men kept their papers were above ground."

Babson discussed the degrees of safety that are attained by depth and was impressed by the amount of protection furnished various facilities by even as little as 3 ft. underground coverage. With greater depth there would be more protection.

In an oil-field area, Babson is constructing a vault near Eureka, Kans., in the "relatively safe Middle West" to hold film records of his valuable papers. He believes a directed missile fired from the safety of another country or from a submarine rising suddenly off the coast can destroy a port city in the flash of a Hiroshima and start a third world war.

BUCKEYE MODEL 12 digs more trench in less time, at lower cost. Digs trench 15" to 24" wide — up to 5½' deep.

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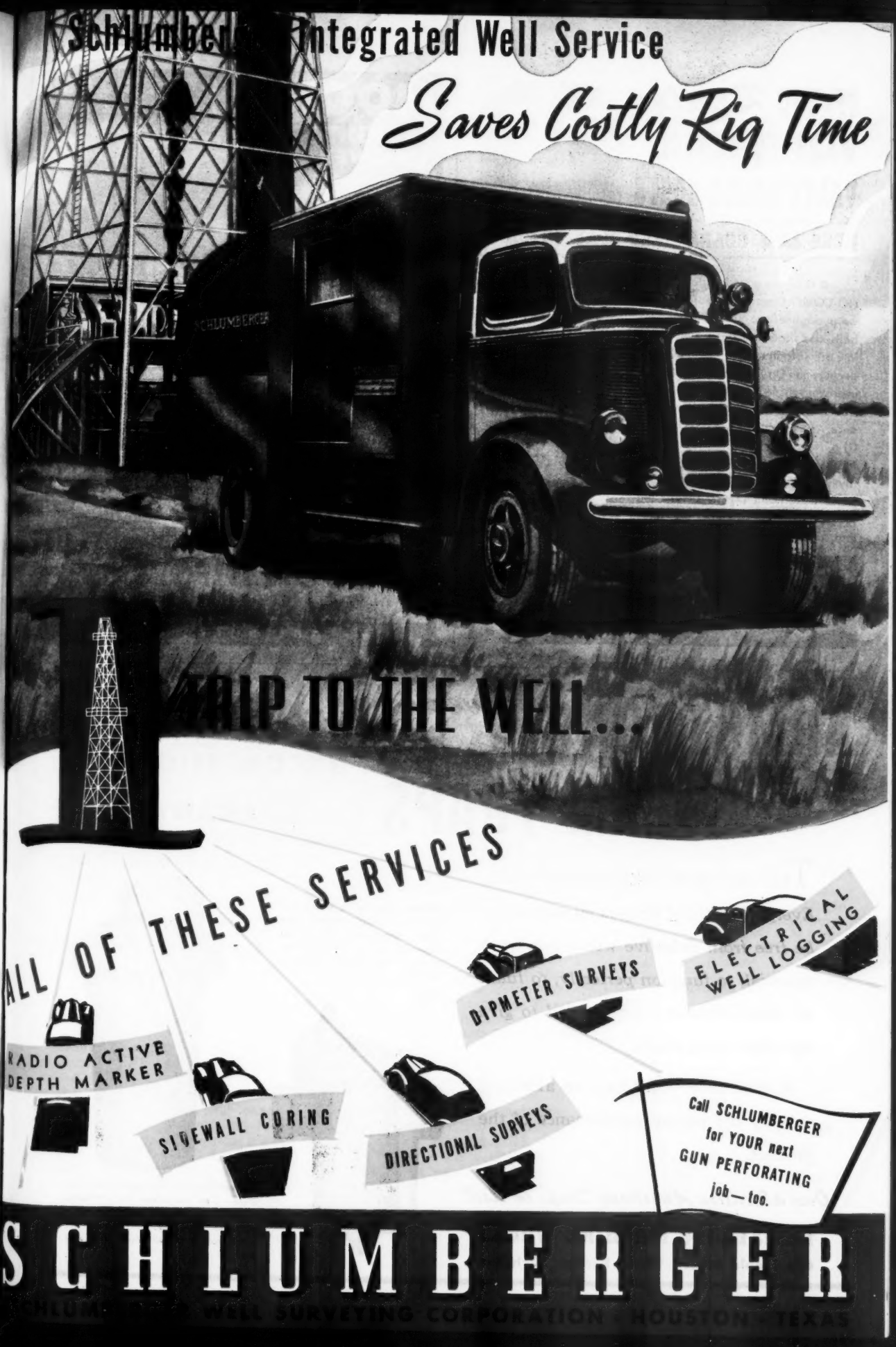
217 Railway Exchange Building
Kansas City 6, Missouri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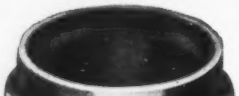
IF YOU *Really* WANT TO REDUCE VALVE CHECK COSTS

HERE IS A GUARANTEED WAY TO DO IT!

● YOU are safe in adopting the NO-CO-RO Drop and Seat because we guarantee it to outlast the two best balls and seats you have ever used. WE are safe in making this guarantee because the Drop and Seat is a basic improvement in valve check design with an impressive record of performance. Among other advantages it offers (1) perfect balance; (2) a bearing the full length of the drop; (3) steady, rhythmic operation without rattle, clatter or flutter, and (4) the time-tested protection of NO-CO-RO, the alloy that does not chip, pit or corrode.



The Drop and Seat is not just another valve check but a basic advance in valve check design.

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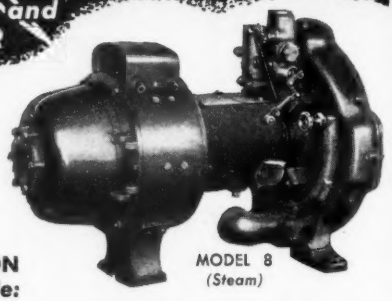
MOON for LIGHT and POWER Generators TURBO and BELT DRIVEN

HERE'S your ideal small power plant for lights, ventilating fans, or other electrical equipment.



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(Steam)

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- **ONLY 2 EASY-TO-REACH OILING POINTS** . . .
- **AUTOMATIC CUT-OFF** on larger capacity Steam-driven models prevents overload damage to generator . . . . . .

53 years of dependable MOON service the world over on *Steamships — Tugboats — Dredges* — and other Marine equipment; *Railroad Locomotives; Oil Field Equipment; Cranes, Derricks* and other construction and road-building machinery. Models from 1 to 7½ KW capacity.

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MOON MFG. CO.
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ARMSTRONG *Inverted Bucket* STEAM TRAPS

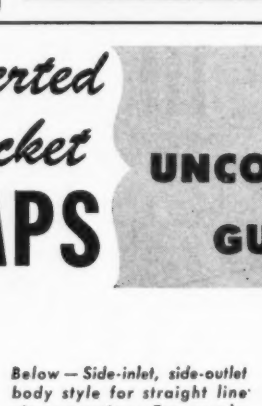
ARE UNCONDITIONALLY GUARANTEED

THE ARMSTRONG GUARANTEE:

Every Armstrong Trap is guaranteed to be free from defective workmanship or material, to function perfectly, to fulfill all claims in every respect and to give complete satisfaction.

A guarantee that can be afforded only by the proved performance of the product.

Below — Side-inlet, side-outlet body style for straight line pipe connections. Trap can be inspected or repaired by removing cap, leaving body in the line.



Above—Bottom-inlet, top-outlet body style. Cast semi-steel for pressures to 250 psi. Forged steel for pressures to 2400 psi. and where the extra safety of all steel fittings is desired.

Over a Million Armstrong Traps in Use!

ARMSTRONG MACHINE WORKS
868 Maple Street, Three Rivers, Michigan

NATURAL GAS

Lone Star Gas Wins Appeal in Tax Case

AUSTIN, Tex.—The Texas Supreme Court has left in effect lower court decisions under which Lone Star Gas Co. saved more than $55,000 in state taxes in a 1942 reorganization.

When Lone Star Gas Corp. reorganized under an order of the U. S. Securities and Exchange Commission, the company contended it was entitled to the benefits of a beginner's gross-receipt tax rate for the first quarter of 1943. The company paid the $50 beginner's tax instead of $55,780 which the Texas comptroller said it owed as a continuing corporation. The state District Court and the Appeals Court upheld the company's position.

More Natural Gas Provided Northern Illinois Company

WASHINGTON. — Federal Power Commission has authorized Natural Gas Pipeline Co. of America to deliver natural gas into the distribution system of Western United Gas & Electric Co. for Chicago District Pipeline Co.'s account, and to construct necessary facilities to effect the delivery.

Western United, which serves mixed natural and manufactured gas to a number of northern Illinois communities, including Aurora, Elgin, and Joliet, plans to convert a segment of its local service to straight natural gas. Natural Gas Pipeline will effect deliveries into Western United's lines by means of tap and pipe-line connections at two points where the former company's lines cross those of the latter.

A.G.A. Picks San Francisco For Next Year's Meeting

The American Gas Association will hold its first meeting on the Pacific Coast next year when its twenty-ninth annual convention opens in San Francisco September 29, 1947.

A.G.A. scheduled its 1942 convention for San Francisco but cancelled the meeting because of war conditions. The decision to hold the 1947 meeting in San Francisco was made by a committee at A.G.A.'s recent Atlantic City, N. J., convention. A general session unanimously adopted the committee's report. The question of holding an exhibit at the San Francisco meeting has been referred to the Gas Appliance Manufacturers Association and the Pacific Coast Gas Association, A.G.A. officials said.

Southern California Gas Co. Gets A.G.A. Safety Award

The butadiene-production department of Southern California Gas Co., Los Angeles, was honored at the recent twenty-eighth annual convention of the American Gas Association in Atlantic City, N. J., when a representative of the department received the merit award for outstanding achievement in accident prevention.

The department, consisting of 709 employes, established a safety record of working from August 1, 1945, to April 7, 1946, a total of 1,020,000 consecutive man-hours without a disabling accident. The award was recommended by the accident-prevention committee and approved by A.G.A.'s executive board.

Natural-Gas Statistics Listed in Bureau Report

WASHINGTON.—The U. S. Bureau of Mines has issued a detailed report on natural-gas production, prices, consumption, and movement in 1944. The study contains considerable data of interest to the gas industry, despite the fact it covers a period now nearly 2 years old.

Among the statistics presented in the report were the following:

Marketed production of natural gas increased 9 per cent over 1943 to a total of 3,711,039,000,000 cu. ft. Texas production gained 15 per cent to 1,525,515,000,000 cu. ft. to account for 41 per cent of the national total, compared with 39 per cent in 1943.

Reflecting in part the introduction of gas from Southwest producing states into the Appalachian area, West Virginia gas production showed a 19 per cent drop to its lowest level since 1939.

Consumption in the United States (marketed production less exports) rose from 3,403,749,000,000 cu. ft. in 1943 to 3,696,463,000,000. Consumption of the total market by principal groups included: domestic, 15 per cent; commercial, 6 per cent; oil and gas field use, 23 per cent; carbon-black manufacture, 10 per cent; fuel at refineries, 8 per cent; and other industrial uses, including public-utility power plants, 38 per cent.

West Edmond Hearing Reset

OKLAHOMA CITY. — A Corporation Commission hearing on revising regulations covering the Hunton lime zone of West Edmond field has been postponed until November 7. The application for the revised regulations was filed by Walker T. Pound, Oklahoma chief conservation officer, who is expected to seek further curtailment of gas venting in the field. Pound requested postponement of the hearing because, he said, his staff has not had time to assemble necessary data.

Court Appeal Refused

WASHINGTON. — The U. S. Supreme Court has refused to hear objections of Arkansas Natural Gas Corp. to a Securities and Exchange Commission order requiring the company to divorce its gas and oil businesses. The utility company operates a gas subsidiary, Arkansas-Louisiana Gas Co., and has three other subsidiaries concerned with oil production, refining, and distribution.

Natural Gasoline

Stanolind to Construct Slaughter Field Plant

DALLAS. — According to reports from West Texas, Stanolind Oil & Gas Co. is planning construction of a 90,000,000-cu. ft. daily capacity natural-gasoline plant in Slaughter field, Hockley and Cochran counties, as soon as materials are available.

The proposed plant would utilize gas presently being flared in Slaughter field. Residue gas from the plant would go into the El Paso Natural Gas Co. line at Jal, N. M., for transport to California markets through the Texas-Los Angeles pipe line now being built.

Union Completes L.P.G. Facilities at Cut Bank

CUT BANK, Mont.—Union Oil Co. of California has completed installation of $200,000 worth of facilities for the manufacture of liquefied petroleum gases at its 4,500 bbl. daily capacity Cut Bank refinery.

Work of enlargement of the absorption plant was started last spring. E. M. Parkin, superintendent of plant operations, said production is under way, although the plant is not working at full capacity. L.P.G. is now being shipped from the plant to Williston, N. D., and Spokane.

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Super Shrink-Grip TOOL JOINTS

can give you these features

THE SHRINK-GRIP "SAFETY AREA"

SEALS AGAINST LEAKAGE . . . AND SUPPORTS THE DRILL PIPE AGAINST BREAKAGE AT THE LAST ENGAGED THREAD

THE TOOL JOINT SHOULDER ASSURES PROPER MAKE-UP AND EFFECTS A SEAL

THE END OF THE PIPE IS *"SHRUNK-ON"* TIGHT AGAINST THE SHOULDER STOP IN THE TOOL JOINT.

Plus **APPLICATION OR REPLACEMENT BY HAND** _____ *Anywhere!*

NO GAUGING OR SELECTIVE FITTING REQUIRED

Reed ROLLER BIT COMPANY

HOUSTON 1, TEXAS

STATISTICS and

WEEKLY WELL COMPLETIONS . . . WEEK ENDED OCTOBER 19, 1946

	Total of all wells					Cum.		Wildcat completions and discoveries					Cumulative total, 1946				
	Comp.	Oil	Gas	Dry	Footage	1946	1945	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	30	14	0	*16	42,214	1,269	1,177	0	0	0	0	0	0	0	0	0	0
Pennsylvania	76	40	5	†31	113,033	3,190	3,298	0	0	0	0	0	0	0	0	0	0
West Virginia	23	2	15	6	74,119	595	651	0	0	0	0	0	0	0	0	0	0
Ohio	29	6	15	8	78,796	997	767	0	0	0	0	0	3	0	12	31	46
Indiana	11	4	0	7	21,170	300	157	0	0	0	1	1	3	0	0	16	19
Kentucky	15	3	2	10	31,738	376	433	1	0	0	0	1	6	0	0	31	37
Illinois	68	39	0	29	172,717	1,862	1,428	4	0	0	16	20	46	0	1	364	411
Michigan	13	2	3	8	26,404	653	605	1	0	0	1	2	20	0	7	208	235
Kansas	27	11	5	‡11	86,519	1,582	1,377	0	0	0	2	2	25	0	1	203	229
Neb., Mo., Iowa	0	0	0	0	0	15	19	0	0	0	0	0	0	0	0	11	11
Oklahoma	71	35	14	22	205,589	2,252	1,923	3	0	2	15	20	71	0	34	281	386
Texas	128	66	17	45	596,375	6,305	5,768	4	2	2	29	37	177	25	29	1,044	1,275
North Central	27	14	0	13	95,863	2,223	1,769	1	0	0	8	9	59	0	4	425	488
West	40	31	0	9	174,017	1,387	1,420	2	0	0	3	5	44	0	1	146	191
Panhandle	5	3	2	0	15,090	264	451	0	0	0	0	0	0	0	0	5	5
Eastern	21	4	11	6	129,010	575	279	0	1	2	5	8	15	1	4	79	99
Gulf Coast	23	9	2	12	143,739	1,389	1,330	1	1	0	11	13	40	22	11	214	287
Southwest	12	5	2	5	38,656	467	519	0	0	0	2	2	19	2	9	175	205
Louisiana	29	14	3	12	168,412	1,098	850	1	0	0	2	3	43	10	7	150	210
Northern	16	7	3	6	52,194	621	347	1	0	0	0	1	9	0	2	82	93
Southern	13	7	0	6	116,218	477	503	0	0	0	2	2	34	10	5	68	117
Arkansas	5	2	0	3	18,093	146	145	0	0	0	2	2	7	0	0	32	39
Mississippi	4	4	0	0	39,009	196	295	0	0	0	0	0	1	0	1	54	56
Southeastern States	1	0	0	1	4,557	36	47	0	0	0	1	1	1	0	0	30	31
Montana	7	2	1	4	13,554	256	259	0	0	0	0	0	10	0	2	27	39
Wyoming	3	1	1	1	17,691	136	172	0	0	0	0	0	11	0	3	30	44
Colorado-Utah	5	5	0	0	29,367	127	43	0	0	0	0	0	4	0	0	14	18
New Mexico	4	3	0	1	15,653	323	341	0	0	0	1	1	3	0	0	31	34
California	21	14	0	7	111,798	1,268	1,837	1	0	0	6	7	22	0	4	181	207
Total United States	570	267	81	222	1,866,808	22,982	21,592	15	2	4	76	97	453	35	101	2,738	3,327
Total previous week	558	297	61	200	1,738,857	22,412	21,060	15	1	2	63	81	438	33	97	2,662	3,230
Total Oct. 30, 1945	532	278	45	209	1,969,532			6	0	0	74	80	412	19	111	2,761	3,303

Service wells included: *16, †29, ‡1.

MARKET QUOTATIONS

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Texas	West Tex.*
18-18.9	$1.17	....	....	....
19-19.9	1.21	....	$1.41	....
20-20.9	1.24	$1.20	1.43	1.07
21-21.9	1.28	1.22	1.45	1.09
22-22.9	1.32	1.24	1.47	1.11
23-23.9	1.35	1.26	1.49	1.13
24-24.9	1.39	1.28	1.51	1.15
25-25.9	1.43	1.30	1.53	1.17
26-26.9	1.46	1.32	1.55	1.19
27-27.9	1.50	1.34	1.57	1.21
28-28.9	1.54	1.36	1.59	1.23
29-29.9	1.57	1.38	1.61	1.25
30-30.9	1.61	1.40	1.63	1.27
31-31.9	....	1.42	1.65	1.29
32-32.9	....	1.44	1.67	1.31
33-33.9	....	1.46	1.69	1.33
34-34.9	....	1.48	1.71	1.35
35-35.9	....	1.50	1.73	1.37
36-36.9	....	1.52	1.75	1.39
37-37.9	....	1.54	1.77	1.41
38-38.9	....	1.56	1.79	1.43
39-39.9	....	1.58	1.81	1.45
40 and above	....	1.60	1.83	1.47

*Includes Lea County, New Mexico.

(Quotations shown here are f.o.b. plant in tank cars and in cents per gal. as of last Monday.

REFINERY GASOLINE

Octane (A.S.T.M.)	78-78½†	73-75
Mid-Continent*	7.375-7.625	6.625-7.000
Tex. Gulf Coast	7.250	6.500-6.750
New York Harbor	8.750-9.500	7.750-8.500
California		6.250-6.750

*Basic Oklahoma Group 3. †1939 C.F.R. (research method).

NATURAL GASOLINE

Grades—	26-70	18-55
Oklahoma (Group 3)	4.750	5.700
N. Texas (f.o.b. plant)	4-4.25	4.8-5.1
N. Louisiana (f.o.b. plant)	4.500	5.400
California (averages)	5.500	6.250

CRUDE-OIL PRICES

Representative posted schedules per bbl.

East Texas	$1.60
Kettleman Hills, California*	1.69
Beauregard Parish	1.55
Illinois Basin	1.72
Pecos County, Texas	1.30
Bradford, Pennsylvania	3.41
Eastern Ill. and Western Ind.	1.47

Note: Crude prices exclusive of subsidy.

*For 37-37.9 gravity.

A.P.I. REFINERY REPORT

Week ended October 12, 1946
(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks—Gasoline	Stocks—Distillate	Stocks—Residual
East Coast	786	21,324	23,259	12,530
Appalachian	146	3,071	714	610
Ill., Ind., Ky.	779	15,325	8,840	5,563
Okla., Kan., Mo.	377	8,649	3,560	1,319
Inland Tex.	205	2,723	634	798
Tex. Gulf Cst.	1,208	13,183	9,881	8,039
La. Gulf Cst.	355	4,237	3,362	2,088
N. La., Ark.	59	1,557	502	230
Rocky Mtn.	132	1,461	604	784
California	820	15,055	12,056	27,792
Total 10-12-46	4,867	86,585	63,412	59,753
Total 10- 5-46	4,865	85,409	62,214	58,611
Total 10-13-45	3,609	70,791	41,960	45,453

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended—	Bbl. of crude*
October 12, 1946	221,931,000
October 5, 1946	221,782,000
October 13, 1945	227,554,000

*Excludes unrefinable Calif. stocks.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

	Oct. 19 crude oil	B. of M. Oct. demand	Oct. 12 crude oil
Alabama	1,000	1,200	1,050
Arkansas	78,350	77,000	78,650
California	872 300	850 000	869.200
Colorado	36,160	32,000	36,940
Eastern	69,000	64,200	67,250
Florida	.....	200	.....
Illinois	205,100	214,000	206,900
Indiana	18,700	19,000	18,750
Kansas	267,050	264,000	271,300
Kentucky	30,350	30,000	30,600
Louisiana	402,550	383,000	401,650
North Louisiana	96,950	.....	96,750
South Louisiana	305,600	.....	304,900
Michigan	45,497	47,000	50,525
Mississippi	76,405	60,000	74,205
Montana	25,350	24,000	24,680
Nebraska	750	800	700
New Mexico	99,100	100,000	99,250
Oklahoma	353,650	384,000	352,650
Texas	2,046,550	2,120,000	2,064,300
District 1 (Southwest)	19,450	.....	19,425
District 2 (Southwest)	144 800	.....	146,400
District 4 (Southwest)	214,300	.....	216,700
District 5 (Gulf Coast)	449,300	.....	455,900
District 5 (Eastern)	40,000	.....	40,300
District 6 (Eastern)	102,450	.....	102,900
East Texas field	316,000	.....	320,300
District 7C (West)	27,450	.....	27,300
District 8 (West)	484.700	.....	487.500
District 7B (W. Central)	33,500	.....	33,225
District 9 (N. Central)	129,700	.....	129,400
District 10 (Panhandle)	84,900	.....	84,950
Wyoming	107,770	100,000	108,010
Miscellaneous other	-	600	.....
Total United States	*4,735,632	4,771,000	4,756,610

Change from prev. wk., down 20,978

Total production January 1-October 19 ..... †1,385,752,939 bbl.

Same period last year (crude, plus condensate) 1,380,449,375 bbl.

*Not incl. 22.670 bbl. condensate. †Incl. 7,050,070 bbl. condensate.

CRUDE-OIL STOCKS 221,931,000 bbl. as of October 12—up 149,000 bbl. One year ago 227,554,000 bbl.

GASOLINE STOCKS 86,585,000 bbl. as of October 12—up 1,176,000 bbl. One year ago 70,791,000 bbl.

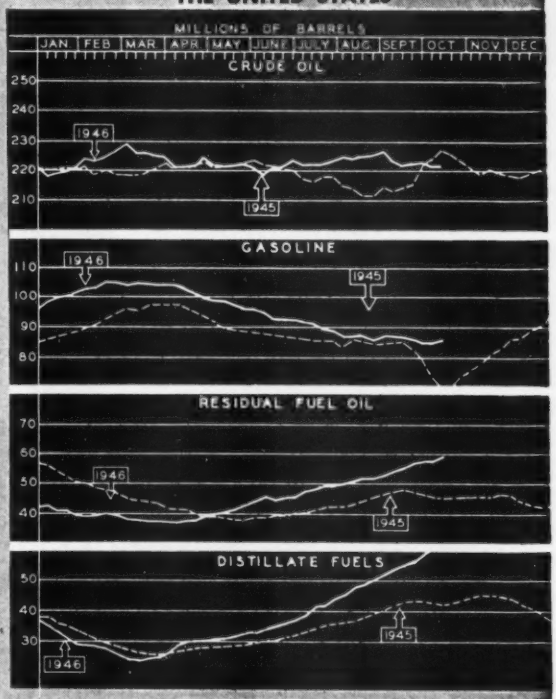
RESIDUAL FUEL-OIL STOCKS 59,753,000 bbl. as of October 12—up 1,142,000 bbl. One year ago 45,453,000 bbl.

GAS OIL AND DISTILLATE STOCKS 63,412,000 bbl. as of October 12—up 1,198,000 bbl. One year ago 41,960,000 bbl.

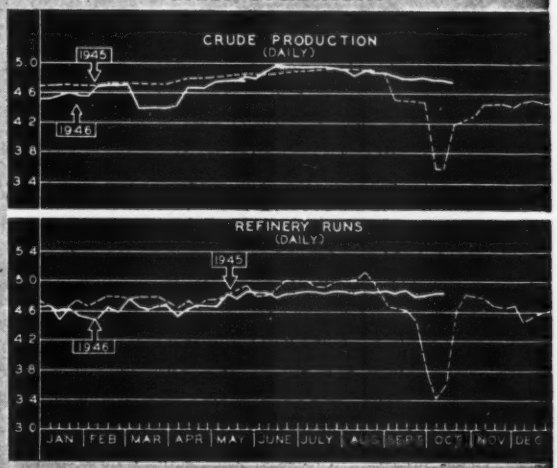
CRUDE-OIL PRODUCTION 4,758,302 bbl. as of October 19—down 20,978 bbl. One year ago 4,227,850 bbl.

REFINERY RUNS 4,867,000 bbl. daily week ended October 12—up 2,000 bbl. One year ago 3,609,000 bbl.

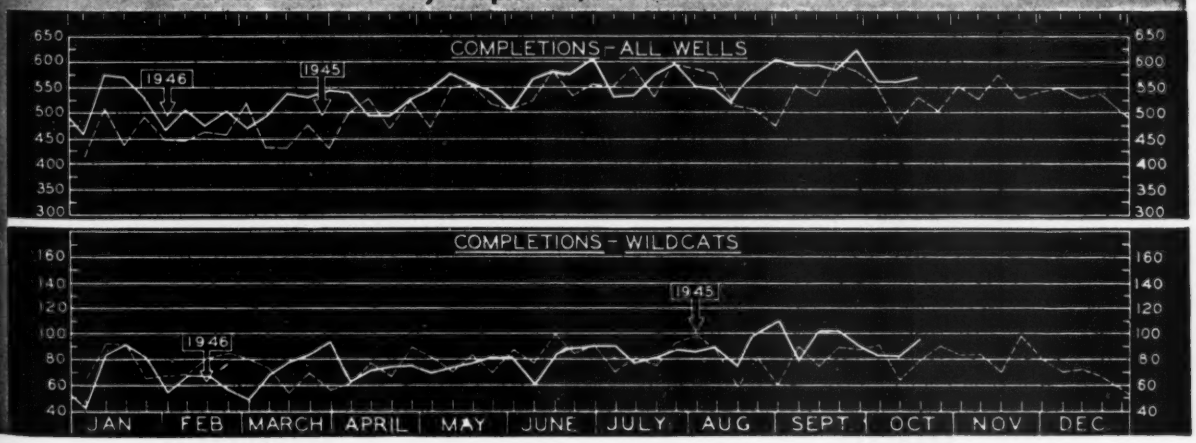
OIL STOCKS IN THE UNITED STATES



DAILY OPERATIONS



Solid line charts weekly completions, service wells in Eastern area included



NORRIS BLUE RIBBON

WORKING BARRELS

The Barrel with the **BLUE** *Finish*

NORRIS *Blue Ribbon*

Seamless Steel Working Barrels—*"The Barrel with the BLUE Finish"* has the highest inside finish of any barrel on the market. Reamed and polished, insures extremely long valve cup life. The tolerances to which they are held are well within A. P. I. Standards. Made from the highest quality seamless cold drawn steel tubes, manufactured to NORRIS exacting standards of precision, with careful inspections guarding each step in manufacture, they are free from all defects. Also furnished in bronze for corrosive conditions, of the same precision manufacture to A. P. I. Standards. For over half a century the name W. C. NORRIS has been synonymous with highest quality in oil tools; *for maximum production, longer life and freedom from breakdowns, specify NORRIS Blue Ribbon—the prize winner among working barrels.*

EXPERIENCE BUILDING OIL TOOLS SINCE 1882

W.C. NORRIS MANUFACTURER, INC.

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QUALITY NORRIS MAKES FRIENDS

EXPORT OFFICE
ROOM 1940, 30 ROCKEFELLER PLAZA
NEW YORK CITY

Exploration and Drilling

Some Future Oil Provinces

SOME of the pessimists about the future oil supply of the the United States are like blind men trying to conceive what an elephant looks like by feeling the various parts they happen to be standing near. They never get the concept of the whole animal, because they don't "see" the whole picture.

Modern geological and geophysical methods of exploration for oil have become very complex, because we know so much more about geology nowadays. As a result, exploratory campaigns are large in scope, and complex. As a consequence initially they appear to be slow in getting results. Those who do not attend the A.A.P.G. meeting at Biloxi this week may not grasp that the geologists there are putting pieces of evidence together on about 100,000 sq. mi. of eastern Gulf Coastal area that will ultimately result in a lot of oil over the next 10 to 15 years.

Or let's look at a few wildcats in the Rocky Mountains that are not attracting particular attention from anyone except exploration men with "vision." Rangely is a well-known name now, so most oil men know northwest Colorado has a major oil field, close to the Utah line. Some of them are noting that Continental Oil Co. 1 Smith, SE SW 30-5n-98w, on the Elk Springs structure, 28 miles northeast of Rangely, appears to be an almost certain field opener.

But other exploration men know that far more than a Rangely and an Elk Springs are involved. The entire Uinta basin must now be considered good potential oil territory. This basin covers over 13,000 sq. mi., much of it in Utah, and in the deeper parts will have a 20,000-ft. sedimentary section to test. In area it is four times as big as the Big Horn basin of northwest Wyoming, where Elk Basin and many other fields produce. A Carter Oil Co. wildcat drilling in Utah 60 miles west of Elk Springs, to geologists, is simply another part of the same regional play. It will take years to test and develop the whole basin.

Now let's drop south to the northwest corner of New Mexico. Here we have the San Juan basin, a 12,000-sq. mi. area, which may connect through some narrow openings to the equally big Black Mesa basin in northeastern Arizona. Conservatively, either of these, in the deeper parts, will have as much as 12,000 ft. of sedimentary section. The San Juan basin is "hot," and the lease play has extended from northwest New Mexico into southwestern Colorado and over into southeastern Utah.

The San Juan basin has the old shallow fields of Rattlesnake, Table Mesa, and Hogback along the western rim to prove oil is present. At this writing, two wildcats are being watched very closely. P. B. English and Byrd-Frost 1 Government, NW SW 4-27n-10w, on the Kutz Canyon structure, is headed for the Dakota, but has recovered distillate, gas, and oil on drill-stem tests and in cores from the Upper Cretaceous. Meanwhile unconfirmed reports claim that a bleeding core was recovered from around 7,500 ft. in the top of the Pennsylvanian in Southern Union Production Co. 17 Barker Creek dome, NW NW 27-32n-14w, drilling down dip from three big gas wells (40-60,000,000 cu. ft.). The well is "tight" and is now drilling below 9,000 ft. headed for lower Pennsylvanian.

Over in the Black Mesa basin, small amounts of oil have been produced intermittently since 1908 from Permian and Pennsylvanian; there are oil seeps along the San Juan River from the same formations, and in Triassic beds northwest of the area.

To an industry that has flown across the Andes Mountains in South America, all the material and men necessary to drill a wildcat in the llanos regions, the Uinta, San Juan, and Black Mesa basins are not remote. An industry that is using airplanes, diving bells, and radar in an exploration campaign in the Gulf of Mexico is not acting in a pessimistic manner. It's just that the present exploration campaigns are on such a big scale that many men are "blind" and can't grasp the size of the elephant. The ultimate returns in oil will be commensurate with the size of the campaign.

SOUTHWEST TEXAS

New Field in Prospect For Holzmark Area

CORPUS CHRISTI. — A prospective new pool opener in the Holzmark area of Bee County, Sam Donzis 1 Holzmark, flowed 2 bbl. of pipe-line oil per hour on initial test, with 200 lb. tubing pressure. Drilled to a total depth of 3,502 ft., the well is producing through perforations at 3,486-3,524 ft. and 3,455-65 ft. Operators will put on pump for final completion. This well is located in the J. A. York Survey, 10 miles northwest of Beeville and north of the Holzmark area gas production.

The Sun field in Starr County was extended ½ mile east by Humble Oil & Refining Co. 1 Pena et al, when it gaged a potential of 109 bbl. per day of 46°-gravity clean pipe-line oil through a 9/64-in. choke. Tubing pressure is 450 lb., and gas-oil ratio 470 to 1. Production is through perforations at 4,632-42 ft. Total depth is 5,258 ft., with 5½-in. casing set to 4,690 ft. Humble is drilling its 2 Pena 933 ft. northwest of this well.

Hecar Oil Co. 1 Jamie Hunes, wildcat 3 miles north of Refugio and north of the old Refugio field, is flowing an estimated 80 per cent oil and 20 per cent water through new perforations at 6,412-19 ft. Total depth is 6,465 ft., with sand logged at 6,380-6,450 ft. It is located in the John Malone Survey, Abstract 48.

In Duval County, approximately 1½ miles northeast of the Agua Prieta field, Taylor Refining Co. 1-G E. A. Parr, wildcat test in SA&MG Survey 6, tried to blow out at total depth of 9,200 ft. Operators are conditioning mud to control the pressure.

The new locations included 14 wildcats, located 3 in Starr, 2 in Nueces, 2 in Refugio, and 1 each in Aransas, Bexar, Duval, Live Oak, McMullen, San Patricio and Willacy counties. The Seeligson field received four and Stratton field three. The exploratory drilling resulted in one new oil pool and eight dry holes. The new pool is in Bee County, the failures, two in Brooks, and one each in Calhoun, Duval, Hidalgo, Live Oak, Nueces and Zavala counties. There were a total of 26 completions, 10 oil wells with initial production of 600 bbl., 4 gas wells, and 12 dry holes.

SOUTHWEST TEXAS SUCCESSFUL WILDCAT

Bee County: New oil discovery, Cosden-Wilcox — Mackhank Petroleum Co. 1 W. D. Walton et al, in John Pace Sur., ⅝ mi. SW of 1 Freeland gas-condensate discovery, top pay 7,066 ft., TD 7,320 ft., perf. 7,006-72 ft., PT 117 bbl. oil per day through a ⅛-in. choke, gas-oil ratio 2,125 to 1, TP 1,350 lb., CP 2,450 lb., gravity 37°, no water.

SOUTHWEST TEXAS WILDCAT FAILURES

Brooks County: L. M. Lockhart and I. K. Howeth 1 Kathleen J. Hocker, Palo Blanco grant, dry, TD 4,706 ft.

Geo. Parker and Chas. McCune 1 A. Hinojosa, in Palo Blanco de Antonio Pena grant, 1 mi. W of Palo Blanco field, dry, TD 5,407 ft.

Calhoun County: Cecil H. McSpadden et al 1 W. C. Melbourn, Block 7 of Bur-

ton & Hoover subd., M. Cavasos Sur., 6 mi. SE of Port Lavaca, dry, TD 6,003 ft.

Duval County: Newman Bros. Drlg. Co. and R. S. Hays 1 Lulu Pursch, BS&F Sur. 115, 15 mi. NE of Freer, dry, TD 3,300 ft.

Hidalgo County: T. F. Murchison 1 C. O. Maddox, in Porcion 46, 12 mi. W of Mission, dry, TD 6,075 ft.

Live Oak County: Henderson Coquat 1-C Kittie West Schreiner, in Samuel Vanover Sur., 5 miles SW of Three Rivers, dry, TD 2,676 ft.

Nueces County: H. R. Smith and W. C. McBride, Inc., 1 G. A. Parr, Block 7, Sec. 16, Scott's subd. of Benton Pasture subd., 2½ mi. S of Agua Dulce, dry, TD 6,505 ft.

Zavala County: Texas Co. 1 Cross S. Ranch, Inc., Pedro Jose de Aguirre grant, 8 mi. N of Crystal City, dry, TD 4,302 ft.

PERMIAN BASIN

First Mississippian Oil in West Texas

MIDLAND.—First commercial production in West Texas from a zone of the Mississippian age was reported in Glasscock County last week at Shell Oil Co. 1 Clark, 5-32-4s, T&P Survey, 8 miles north of Garden City. The well was said to have flowed 207 bbl. of oil and 11 bbl. of salt water into tanks through 15/64-in. choke, in 19 hours from casing perforations at 9,740-55 ft. Oil was 56° gravity and black in color. Operators continued testing.

Location of the new discovery is also about 8 miles south of the Howard-Glasscock area, where production is found in a number of shallow zones from 1,400 to 3,000 ft.

First Devonian production for the Block 12 field in Andrews County was indicated last week when Atlantic Refining Co. 1-E Texu, northeast corner of Section 18, showed gas in 30 minutes of a drill-stem test at 8,455-510 ft. It recovered 550 ft. of fluid, with the top 350 ft. carrying gas-cut mud and some oil showings. The lower 200 ft. was cut with oil and gas and had some free oil in the bottom. Operators lost the last four stands of fluid but will take another test at 8,560 ft.

Humble Oil & Refining Co. 1-C Cowden, Section 3, Block 45, Township 2 north, T&P Survey, west offset to the Andector discovery, was reported running 600 ft. low on the Ellenburger. A drill-stem test at 9,150-85 ft., open 55 minutes, made a blow of air for 50 minutes and died. It recovered 8,250 ft. of sulfur water, with no oil. Operators were to run electric log.

In Schleicher County, approximately 3½ miles east of Eldorado, operators were moving in material for a 6,000-ft. wildcat at L. W. Elliott 1 Virgil G. Tisdale, Section 16, Block A, HE&WT Survey. The test is on a block of 3,120 acres assembled by William Holland and Rudolph Grossenbacher of San Angelo. It will be an Ellenburger test.

In Crane County, Gulf Oil Corp. 8-E McKnight, a wildcat 1 mile north of the McKnight pool, made a 2½-hour drill-stem test at 6,680-6,720 ft., recovering 1,560 ft. of drilling fluid, with only a slight odor of gas. Operators were drilling ahead below 6,720 ft.

In the TXL field, Ector County, Phillips Petroleum Co.'s southeast edge well, in Section 27, Block 45, Township 1 South, T&P Survey, was not too encouraging as operators swabbed for 12 hours, recovering only 42 bbl. of fluid which was mostly water. It is bottomed at 10,925 ft. Operators continued to swab, with the fluid level remaining at 9,000 ft. north of Ellenburger production, but on the field's east side, Phillips 1-H TXL flowed 104 bbl. of oil, cutting only 1 per cent sediment, in 17 hours. Testing was continuing through perforations in casing at 9,680-755 ft.

In Ward County, a north edge well to the Lion field, Lion Oil Refining Co. 6-B University found gas in the Delaware sand at 4,941 ft. and tested some 5,000,000 cu. ft. of gas daily, with no oil. Operators may complete as a gas well.

WEST TEXAS SUCCESSFUL WILDCATS

Ector County: New pool, proposed field name, Andector—Humble Oil & Refining Co. 1-B Cowden et al, Sec. 11, Blk. 45 T&P Sur., flowed 1,176 bbl. oil a day, ⅜-in. choke on 2-in. tubing set at 8,496 ft., gas-oil ratio 110 to 1, gr. 44.2°, Ellenburger 8,545 ft., well flowed natural, TP 585 lb., TD 8,600 ft.

Garza County: Brown, Brown & Comanche 1-A Post estate, Sec. 1,228, J. V. Massey Sur., ¾ mi. N of Post field, pumped 92 bbl. 35.8°-gr. oil a day through 2-in. set at 3,018 ft., gas-oil ratio 200 to 1, pay 2,770 ft., TD 3,450 ft., PB 3,040 ft., elev. 2,578 ft.

WEST TEXAS WILDCAT FAILURES

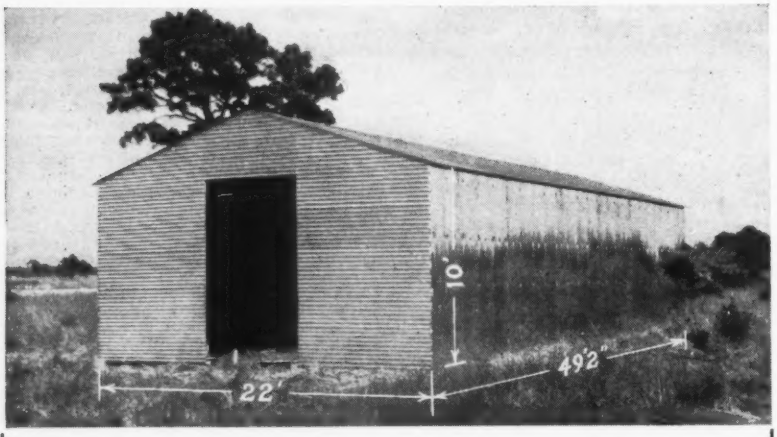
Crockett County: Brewer & Nelms 1 L. B. Cox, Sec. 11 J. H. Gibson Sur., 15½ mi. from south county line, 5½ mi. from west county line, dry, TD 1,215 ft. in lime, elev. 2,464 ft.

Lubbock County: Seaboard Oil Co. 1 J. D. Jenkins, Sec. 27, Blk. D, LS&V Sur., ¼ mi. NW of Monroe, dry, TD 7,520 ft. San Andres 2,170 ft., Glorietta 4,570 ft., Tubb sand 5,700 ft., elev. 3,309 ft.

Pecos County: Olson Drilling Co. 1 E. M. Roots, Sec. 17, Blk. 118, T&St. L. Sur., 8 mi. SE of Ft. Stockton, dry, TD 5,005 ft. in lime, top Queen sand 2,726 ft., elev. 3,039 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Eddy County: Neil H. Wills 1 Crosby, SW NW NE 7-20s-31e, W of Halfway field, dry, TD 2,080 ft. in anhydrite, salt 629-2,070 ft., elev. 3,458 ft.



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SEE PAGE 58

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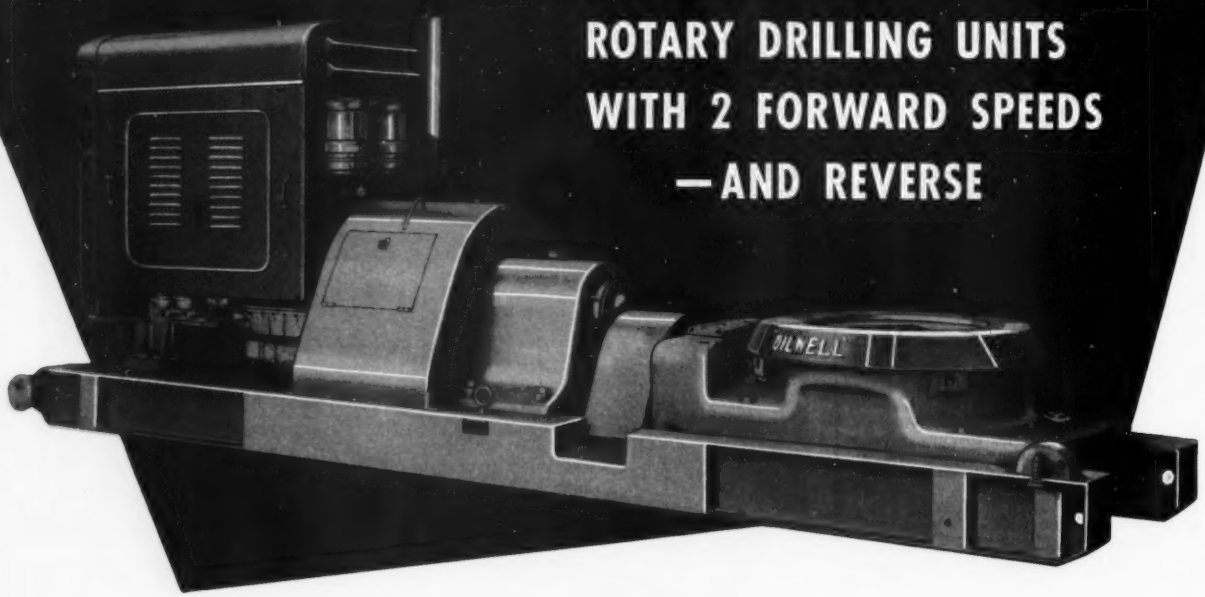

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Speed Ratios: Rotary	3.28:1	3.28:1	3.82:1	3.28:1	3.28:1	3.82:1
Gear Case (Speed Increaser)	1:1.44	1:1.44	1:1.44	1:1.31	1:1.31	1:1.31
"RT" Gear Case (Speed Decrease)	.....	.....	.....	1.68:1	1.68:1	1.68:1
"RT" Gear Case (Reverse)	.....	.....	.....	1.48:1	1.48:1	1.48:1
Dimensions: Height, Over-all	7'4"	7'4"	7'4"	7'4"	7'4"	7'4"
Length, Over-all	20'0"	20'0"	20'0"	21'4"	21'4"	21'4"
Width, Across Skids	4'3¼"	4'3¼"	4'3¼"	4'3¼"	4'3¼"	4'3¼"
Weight, Complete Less Rotary Drive Bushing:						
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EASTERN TEXAS

Wood County Wildcat Will Drill to Smackover Lime

DALLAS.—Humble Oil & Refining Co.'s 1 McKnight, wildcat test on the northeast flank of the Hawkins **Woodbine** field in Wood County, plugged back from 9,168 ft. to 8,970 ft. in the Hill section of the Rodessa, and on a 40-minute drill-stem test at 8,942-70 ft., through a ¼-in. choke, recovered 3,000 ft. of water cushion, 180 ft. of 51.8°-gravity distillate and 500 ft. of distillate-cut mud. Maximum flowing pressure was 1,776 lb. and minimum flowing pressure was 1,734 lb. On last report it was drilling below 9,213 ft.

Having found water in both the Woodbine and Paluxy zones, operators will carry the test on to the Smackover. If successful, it would establish a long hoped-for trend of Smackover production southwest through eastern Texas from Arkansas. At present the only other Smackover production is in the small Eylau pool in southeastern Bowie County. At least three other tests as far south as Houston County have found the Smackover dry.

In Houston County, Ivy & Moran's 3 Murray, a tight hole, apparently has been given up as a duster after showing salt water in a drill-stem test in the Woodbine section at approximately 7,886-7,915 ft. However, on last report, operators planned to drill ahead to the Edwards. Location is in the southwestern part of the county, some 16 miles southwest of Crockett.

The Shelbyville area of Shelby County attracted interest last week with the announcement of B. F. Phillip's wildcat, the 1 Pickering Lumber Co., 3 miles north of the townsite of Shelbyville. It will be a 6,500-ft. Pettit test, drilled on a 3,000-acre farmout recently acquired from P. H. Pewitt of Longview. Location is about 1 mile east of a Travis Peak test to around 6,900 ft., drilled in 1943 by Pewitt.

According to reports, Phillips' rigs are busy and due to press of expiring leases, work is scheduled to get under way soon and the well will be let to contractors.

A 7,500-ft. wildcat test for Franklin County has been marked off 5 miles north of Mount Vernon. W. G. Post will drill the 1 J. H. Anderson in the James H. Walters Survey, Abstract 523.

EAST TEXAS SUCCESSFUL WILDCATS

Leon County, 10 mi. S of Oakwood: Carter-Gragg Oil Co. 1 J. H. Hammett estate, Henry Smith Sur., Abst. 828, elev. 208 ft., flowed 30,000,000 cu. ft. dry gas per day open flow, RP 3,330 lb., Woodbine gas sand 5,752 ft., TD 5,833 ft., PB 5,821 ft., pay 5,786-96 ft.

Navarro County, ½ mi. SW of Angus: Tex Harvey Oil Co. 2 T. L. Jackson, John McNeal Sur., elev. 430 ft., flowed 250,000 cu. ft. dry gas, RP 350 lb., TD 1,430 ft.

Walker County, Kittrel area: Magnolia Petroleum Co. 2 Thompson Long Leaf Lumber Co., flowed 6.88 bbl. 51.5°-gr. distillate, TP 2,380 lb., gas-oil ratio 85,174 to 1, pay 10,545-575 ft. in Edwards, TD 10,752 ft.

EAST TEXAS WILDCAT FAILURES

Angelina County, NW corner: Bennett & Sorrells 1 E. P. McKnight, John Durst Sur., elev. 249 ft., dry, TD 6,380 ft., Woodbine sand cut out.

Ellis County, 12 mi. SW of Ennis: Hughey & Carpenter 1 Feaster, A. D. Claiborne Sur., elev. 425 ft., dry, TD 3,007 ft., Travis Peak 2,910 ft.

Houston County, 10 mi. N of Kennard, 2 mi. SE Weches: Magnolia Petroleum Co. 1-A Southern Pine, Leonard Williams Sur., elev. 351 ft., dry, TD 7,407 ft. in Georgetown lime, Woodbine 5,961 ft.

San Augustine County, 2 mi. SE of Broadus: Combro Oil Co. 1 Mrs. Annie T. Anderson, B. W. Harvey Sur., Abst. 16, elev. 189 ft., dry, TD 4,305 ft., Wilcox 2,490 ft.

Titus County, 1 mi. N of Talco: Humble Oil & Ref. 1 Guaranty Bond State Bank, William Watts Sur., elev. 312 ft., dry, TD 5,391 ft., Georgetown 3,857 ft.

APPALACHIAN FIELD

Three Locations Made Near Fayette County Gas Well

PITTSBURGH.—On Chestnut Ridge in Georges Township, Fayette County, Southwest Pennsylvania, three new locations have been made near the recently completed large gas well. New Penn Development Co., William E. Snee et al, have a location for No. 2 Smith 1,700 ft., southwest; Peoples Natural Gas Co. will drill 1,800 ft. south on the J. R. Smith tract; Manufacturers Light & Heat Co. has staked a location 1,200 ft. northeast on the Jesse S. Eustey farm. The new well is feeding about 13,000,000 cu. ft. of natural gas in the line holding 514 lb. back pressure on the well.

New locations in other deep territory totaled eight during the week. They were in Cowanshannock Township, Armstrong County; Armstrong, Conemaugh, and Washington townships, Indiana County; Beaver and Clover townships, Jefferson County; and Allegheny Township, Westmoreland County.

In Preston County, West Virginia, a 6-in. line is being laid to the 4,350,000 cu. ft. wildcat gas well of William E. Snee, Orville Eberly et al., on the Harrison Sisler farm

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in Portland district. Meanwhile, rock pressure is now showing 2,280 lb. from the chert at 5,622½ ft. The second test on this farm which resulted in a small Oriskany gas well, natural, gaging about 60,000 cu. ft., was acidized with 2,500 gal. followed by 1,500 gal. water. At 1,800 lb. pressure, the sand took the acid at the rate of about 6 gal. a minute. The pressure later dropped to 1,500 lb., and the input rate increased to 15-18 gal. a minute. The water has not yet entirely been cleared from the hole, but the gas coming through now gages about 135,000 cu. ft. The result will not be known until the sand is also cleared of fluid.

In Elk district, Kanawha County, Columbian Carbon Co. completed 863 Hariett Morton for 7,979,000 cu. ft. of gas, natural, from the Oriskany sand with surface elevation at 721 ft.; Corniferous lime, 4,927 ft.; Oriskany, 5,040 ft.; gas 5,057-62 ft.; total depth, 5,062 ft.

In Ravenswood district, Jackson County, Columbian Carbon Co. topped the Oriskany sand at 4,962 ft. from a surface elevation of 797 ft. in the test, 915 J. V. Hall, and at 4,977 ft., there was a gas volume of 1,364,000 cu. ft. In Ripley district, West Virginia Gas Corp. topped the Corniferous lime at 5,040 ft., from a surface elevation of 933 ft., in the test, 542 Cora E. Miller.

N. CENTRAL TEXAS

Haskell County Exploration May Open Strawn

WICHITA FALLS.—Thomas D. Humphreys 1 E. O. Chapman, wildcat located 10 miles northeast of the town of Haskell, in Block 60, Tidwell Survey, was showing for a possible Strawn discovery as the week ended. Tests were to be made in that section after setting casing at 4,240 ft. Shows were found at 4,046-4,100 ft., and at 4,250-4,314 ft. Slight shows were logged at 4,440-50 ft. and 4,860-70 ft. in a sand and an oil stain was found in the Ellenburger at 5,250-60 ft. Total depth is 5,470 ft. Electric log showed a sand body from 4,864-5,004 ft., which was believed to be the Hull-Silk Strawn sand, as found in the Hull-Silk pool of northern Archer County. If productive, a large area will be opened for further exploration.

In Throckmorton County, 6 miles north of the town of Throckmorton, Konrad Sztykgold 1 Richardson, TE&L Survey, had indications of production in the Caddo lime when 300 ft. of oil and 300 ft. of oil-cut mud was recovered on a drill-stem test at 4,645-61 ft. Top of the Caddo was at 4,535 ft. On last report it was drilling at 5,029 ft. in shale and had picked up stains and an odor at 5,014-18 ft. Operators are planning a drill-stem test of the section. Previously, it was reported that the test would be carried to the Mississippian, expected around 5,500 ft., and if unproductive, plugged back to the Caddo.

Six miles southeast of Throckmorton, Section 2, DL&C Survey, Fred M. Manning's 3 McKnight was rigging up rotary and preparing to set surface casing. The test will go to 5,500 ft.

In Jones County, 2 miles north of Truby, Delta Oil Co.'s 1 Grove, new Gunsight lime pool opener, gaged 168 bbl. of 41°-gravity oil per day at 2,680-82 ft., on the pump, showing only a small per cent of sediment and water. Top of the lime was 2,670 ft. Location is on the east side of the J. W. McKissick Survey 204.

In Clay County another new pool was in prospect at Jack Grace 1-B Edwards, S. C. Belden Survey, 7 miles southeast of Henrietta. Bottomed at 5,494 ft., it swabbed 5 bbl. of oil an hour after a shot at 5,468-94 ft.

Continental Oil Co. staked location for a 6,200-ft. rotary wildcat in the northwest corner of Montague County, 4 miles east of the town of Ringgold. It is the 1 Lula Moss, J. W. Clanton Survey, Abstract 1551. Other Montague exploratory work included Eason Oil Co.'s 1 Temple Yarbrough, in the F. J. Bellows Survey, 4 miles north of the town of St. Jo. It is drilling ahead after setting surface pipe. Scheduled depth is 4,500 ft. Ten miles northeast of Nocona, Lesh & McCall 1 R. W. Cunningham estate, "D," Griffin Payne Survey, was drilling below surface pipe on last report.

According to word received here, Stanolind Oil & Gas Co. plans a 6,500-ft. test in Foard County, southeast of the town of Crowell. It will be the 1 Furd Halsell, in the John Shearer Survey, and is on a block of 4,500 acres, offset by Shell Oil Co., Inc., to the south, Bruce Sullivan on the northwest, and Magnolia Petroleum Co. on the east. Over the last 18 months, three tests have been drilled in the area, all of which reported light shows but no commercial production.

Sullivan's 1 McCoy drilled to 5,600 ft., found shows of oil but was abandoned after water intruded. DeKalb Agriculture 1 Kincaid, topped Ellenburger at 5,931 ft., recovered 1,170 ft. of salt water on drill-stem test at 5,932-52 ft., total depth. Magnolia's 1 Rosannah Steele had Canyon lime at 3,597 ft., Ellenburger at 5,630 ft., and on drill-stem test at 5,322-30 ft. recovered 30 ft. of oil and 90 ft. of oil-cut mud. Bottom-hole pressure was 800 lb. in 15 minutes. Another drill-stem test at 5,320-36 ft., open 1 hour, recovered 10 ft. of oil and 88 ft. of oil-cut mud. Total depth was 5,682 ft.

NORTH CENTRAL TEXAS WILDCAT FAILURES

Archer County: R. Clay Underwood 1 D. L. Wolf, Peter J. Bailey Sur., Abst. 30, 8 mi. SW of Archer City, dry at 1,350 ft.
Baylor County: E. B. Clark 1 Cowan, Sec. 92 T&NO Sur., 1 mi. SE of Fulda Switch, dry at 2,725 ft.
Montague County: Phillips Pet. Co. 1 S. D.

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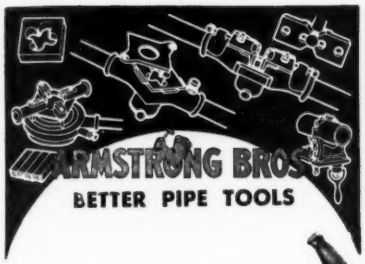

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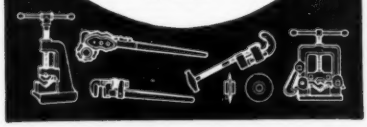

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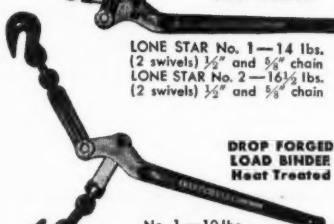
LONE STAR No. 2—16½ lbs. (2 swivels) ½" and ⅝" chain



DROP FORGED LOAD BINDER Heat Treated

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No. 2—17½ lbs. (2 swivels) ½" and ⅝" chain

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No. 33—3 Pulleys, roller bearings, ⅜" rope
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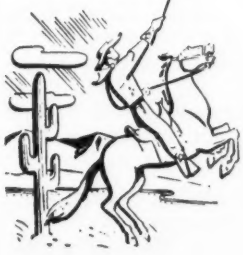

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Howard, Guadalupe College Sur., 6 mi. S of Belcherville, elev. 983 ft., dry, TD 6,430 ft., Canyon 1,920 ft., Caddo 5,924 and 6,055 ft., Viola 6,383 ft., with show of oil in top.

Wichita County: A. R. Dillard 1 T. H. Barwise, Jas. Cole Sur., 7 mi. NE of Electra, elev. 1,101 ft., dry, TD 4,608 ft. in lime, DST 4,222-36 ft. recovered 150 ft. oil-cut mud, DST 4,225-50 ft., recovered 60 ft. oil-cut mud, BHP 300 lb. in 15 minutes, Ellenburger 4,325 ft. with slight show oil.

Wilbarger County: G. E. Kadane & Sons 1 C. Rainwater, Sec. 35, Blk. 13, H&TC RR Sur., ¼ mi. W of Harrold, elev. 1,234 ft., dry at 5,181 ft., no tops available.

WEST CENTRAL TEXAS SUCCESSFUL WILDCAT

Jones County: Extension—Roark, Hooker & Roark 1 F. C. Hodges, A. Bell Sur. A-6, 1½ mi. SW of Nugent, elev. 1,562 ft., pumped 25 bbl. oil, 38°-gr., lime at 1,940-43 ft., TD 1,943 ft.

WEST CENTRAL TEXAS WILDCAT FAILURES

Callahan County: Great Lakes Carbon Corp. 1 W. E. Smith, Sec. 34, BBB&C Sur., 4 mi. SW of Clyde, elev. 2,007 ft., dry, TD 4,849 ft. in sandy lime, DST at 3,115-32 ft., 2 hr., recovered 75,000 cu. ft. gas, Mississippian 4,698 ft., Ellenburger 4,763 ft.

Taylor County: Paul P. Steed 1 Wiley Norwood, Sec. 10, Blk. 5, T&P Sur., 11 mi. S of Merkel, elev. 2,411 ft., dry, TD 4,160 ft. in lime, Dotham lime 2,720 ft., Noodle Creek 2,810 ft.

Ungren & Frazier 1 J. E. Morton, David T. Bruce Sur. 135, 4 mi. N of Tye, elev. 1,695 ft., dry, TD 2,215 ft., coal 2,198-2,201 ft., Flippen sand 2,206 ft.

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TEXAS GULF COAST

New Gas-Condensate Field Opened in Madison County

HOUSTON.—A new gas-condensate pool, 7½ miles southwest of Madisonville, Madison County, has been opened by West Production Co. and Noranda Oil Co. 1 H. M. Boring, in Amy Boatright Survey. On a commission potential the well flowed at the rate of 39 bbl. of 55.8°-gravity condensate daily through a ¼-in. choke, along with 1,053,000 cu. ft. of gas, ratio 27,000 to 1. Flowing pressure on the tubing was 935 lb., and 1,105 lb. on the casing. Shut-in pressure was 3,300 lb. Production is through perforations in the Edwards lime section at 9,495-9,570 ft. and 9,615-30 ft. Total depth is 12,536 ft., with plugged back depth 9,635 ft.

The second well in the new deep sand on the east side of the West Columbia dome, Brazoria County, has been completed at Hogg Oil Co. 11-A Mike Hogg. Drilled to a total depth of 6,505 ft., the well flowed an initial gage of 281 bbl. of oil daily through a ¾-in. choke with 640 lb. flowing pressure on the tubing. Production is through 76 perforations in sands between 6,006 and 6,060 ft. The 5½-in. casing was set at 6,180 ft.

Old Ocean field, Brazoria County, has been extended 2,000 ft. southeast by Magnolia Petroleum Co. and J. S. Abercrombie 1 G. A. Gamble et al, James Cummings Survey. The well is flowing an estimated 300 bbl. of 49°-gravity oil daily through a 25/64-in. choke with 3,400 lb. flowing pressure on the tubing. Total depth is 11,191 ft., with 7-in. casing cemented at 11,000 ft. Production is through 87 perforations at 10,928-942 ft.

Magnolia Petroleum Co. 2 Live Oak, located 1,512 ft. north of the discovery well in the Tide Haven field, Matagorda County, flowed while making a dry test of squeeze job perforations. Pipe had been perforated from 9,930-32 ft. for the squeeze, and while taking a dry test of the job, the well started flowing gas and water with 750 lb. pressure. Another squeeze has been made, and pipe will be perforated for a test of production. Total depth is 10,000 ft. and 7-in. casing is cemented on bottom. The discovery sand in this area was topped 35 ft. high, with no saturation.

There were 10 exploratory starts included in the 23 locations reported this week, 2 each in Fort Bend and Harris counties, and 1 each in Colorado, Jackson, Jefferson, Liberty, Madison, and Montgomery counties. Fort Bend County received the greatest activity with five locations, three being development wells in North Thompson field, and two wildcats. Batson field in Hardin County received two locations. The nine completions included one new gas-condensate pool opener in Madison County, three oil wells, and five dry wildcats located two in Fort Bend, and one each in Brazoria, Jackson and Jefferson counties.

TEXAS GULF COAST SUCCESSFUL WILDCAT

Madison County: New gas-condensate pool West Prodn. Co. and Noranda Oil Co. 1 H. M. Boring, in Amy Boatright Sur., approximately 7½ mi. SW of Madisonville townsite, TD 12,356 ft., PB 9,635 ft., top Edwards lime 9,613 ft., perf. 9,495-9,570 ft. and 9,615-30 ft., PT 39 bbl. condensate per day through a ¼-in. choke, and 1,053,000 cu. ft. gas per day, gas-condensate ratio 27,000 to 1, TP 935 lb., CP 1,105 lb., SI TP 3,300 lb., gravity 55.8°, no water.

TEXAS GULF COAST WILDCAT FAILURES

Brazoria County: Cecil Hagen 1 Mary E. Norris, Lavaca Navigation Co. Sur. 3, in Sandy Point area, dry, TD 8,341 ft.

Fort Bend County: Goldrus Drlg. Co. 1 Otto K. Moehle, E. P. Olcott Sur., 1¾

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mi. SW of Needville, dry, TD 6,367 ft.
Humble 1-B A. P. George, in Lancelot Smith Sur., 300 ft. N of N shore of Smither's Lake, dry, TD 8,150 ft.
Jackson County: Floyd L. Karsten 1 Martin O'Connor, in Elizabeth McNutt Sur., 5 mi. S of Edna, dry, TD 7,023 ft.
Jefferson County: McCarthy Oil & Gas Corp. 1 C. E. Wilbur, T&NO Sur., 3½ mi. E of Stowell field, dry, TD 10,575 ft.

MICHIGAN

Large Number of Failures In Week's Completions

SAGINAW.—Pure Oil Co. A-1 Zimmerman, deep test in Section 12, Orient Township, Ottawa County, dry at 5,292 ft., topped off a bad week in Michigan oil activity. The 13 completions included 2 oil producers, 3 gas wells and 8 dry holes. Of the 2 wildcats, 1 was completed as a 15-bbl. producer in Trowbridge, Allegan, while the other was an Arenac County dry hole in Moffatt Township. The other oil well, in Adams-Arenac, pumped 35 bbl. with salt water on a 10-hour test.

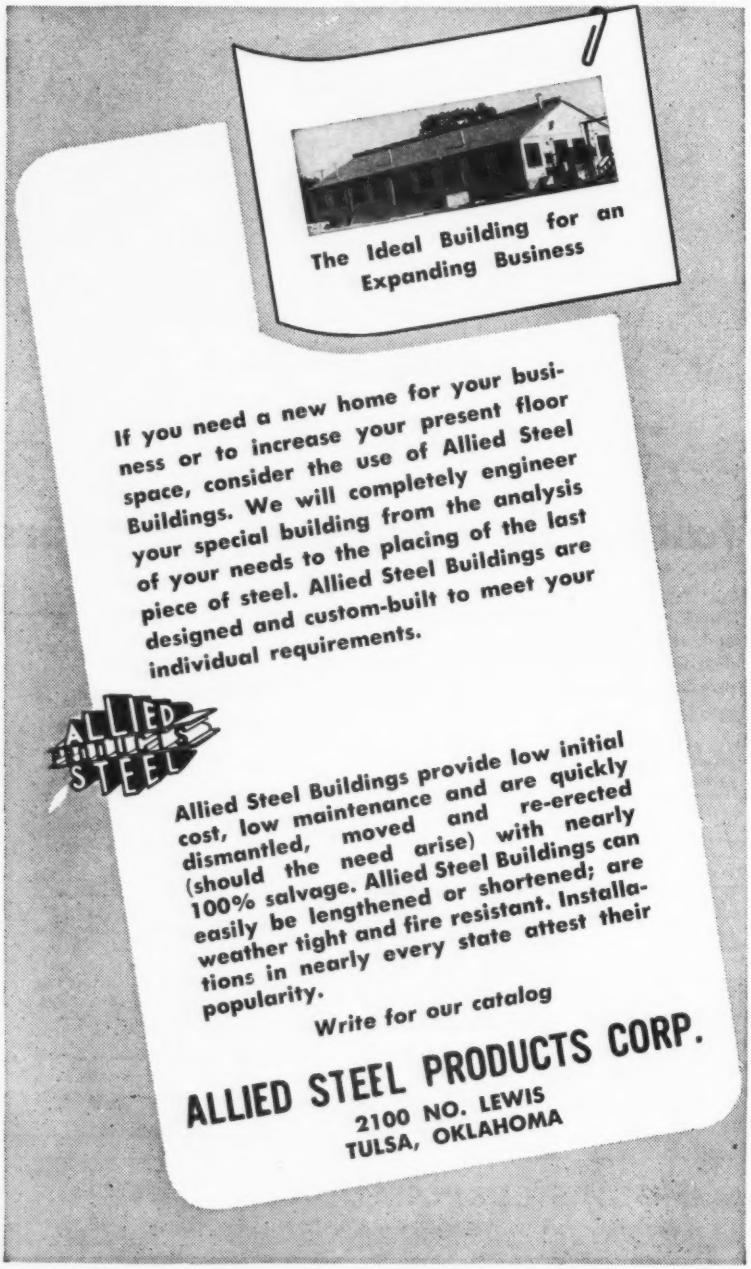
Fourteen new locations include four in Osceola County, two each in Allegan, Lake and Isabella, and one each in Arenac, Kent, Mecosta and Van Buren.

MICHIGAN SUCCESSFUL WILDCAT

Allegan County, Trowbridge Township: Max Spidel 1 Lucy McCarn, NW NW NE 7-1n-13w, pumped 15 bbl., acidized, TD 1,337 ft., in Traverse lime.

MICHIGAN WILDCAT FAILURE

Arenac County, Moffatt Township: Don F. Rayburn 1 Swincicki-Landowski, NW NW NE 28-20n-3e, dry in Dundee, TD 3,356 ft.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CANADIAN FIELDS

Gas Showings Found in Test on Quaich Structure

CHATHAM.—Initial showings similar to those encountered in the first Turner Valley drilling 32 years ago have been met on the Quaich structure in the southern Alberta foothills. Quaich-Globe 1, LSD 12, 35-9-3w5, encountered a substantial wet gas flow in a sand of the Blairmore formation at 1,369 ft. Drillers were setting 16-in. casing when the gas blew in, necessitating a flare line. Production and recovery tests are being made.

In the North Turner Valley Home-Millarville 22, LSD 16, 30-20-3w4, with Madison lime at 8,434-8,956 ft., is making 120 bbl. after acidizing. In the North Extension area, Home-Millarville 23, LSD 7, 5-21-3w5, also a west flank test, with Madison at 8,350-8,800 ft., made 50 bbl. before acidizing, and may be deepened through the entire lower porous zone before acid treatment.

Jumping Pound.—In the Jumping Pound area west of Turner Valley, Shell Exploration 16-14-J, LSD 16, 14-25-5w5, immediately south and west of the discovery well, made 800,000 cu. ft. of wet gas after first acid treatment and has been reacidized.

Conrad.—East of the Taber field in southern Alberta and about 12 miles north of Conrad, Conrad Exploration, subsidiary of California Standard, has secured permit covering 10,978 acres in Townships 9 and 10, Range 14w4, and is planning to test a possible easterly extension of the Conrad field. In the same general area, Imperial-Purple Springs 1, 11-10-15w4, in 1944 got oil with sulfur water in the Ellis sand at 3,135 ft.

Ram River.—In the Ram River-Clearwater area of the central foothills, Ram River Oils 2, LSD 8, 2-37-11w4, bottomed at 4,340 ft., is operating on surge pump with starting pressure of 360 pounds and 130 pounds minimum. A 12-hour run gave 22 bbl., with as much as 40 bbl. in a 24-hour period. Intervals between runs are lessening and production increasing as the hole gradually clears itself of emulsified oil. Production is a light crude from a Devonian horizon. Ram River 4, LSD 9, 36-34-10w4, bottoming at 1,460 ft., is preparing to acidize. Ram River 3, LSD 12, 1-37-11w5, redrilled to 2,896 ft. will deepen to around 4,000 ft. before testing.

Pinhorn.—In the Pinhorn Dome area, southern Alberta, McColl-Union 6-D, LSD 6, 12-4-8w4, struck water in the Bow Island sand at 2,200 ft. and has been abandoned. A further joint test of the gas area, McColl-Union 11-A, is starting in LSD 11, 35-2-8w4, about 4 miles south of the first gasser. Union Oil has taken over an additional 118,281 acres in the general area.

Peace River.—First test of a three-well program for the Peace River area, northern Alberta, Sam Hector and associates of Calgary have located Peace River 1 in LSD 1, 17-84-21w5, on the east bank of the river about 4 miles north from the town. Drilling is primarily for gas to supply the town. Strong gas flows were repeatedly encountered in numerous tests drilled in the Peace River area from 1916 to 1920, but the wells were drowned out by heavy flows of salt water.

Manville.—In the central plains area west of Vermilion, Manville 1 has been located by Waintown Gas & Oil Co. in LSD 6, 28-50-8w4. The area is close to Northwest-Claysmore 1, 24-50-8w4, drilled in 1942 which encountered gas estimated at 2,000,000 cu. ft. in the Viking sand at 1,470 ft.

Lloydminster.—In the Saskatchewan sec-

tion of the Lloydminster field, Husky Oil & Refining 4, LSD 4, 14-47-27w3, was deepened from 1,813 ft. where gas was struck in an underlying oil sand. Gas flow, estimated at 10,000,000 cu. ft., blew out of control, with some oil, estimated around 150 bbl. Attempts are being made to shut off the gas and take oil production.

ROCKY MOUNTAIN

Southwest Montana Play Draws Wide Interest

DENVER.—Reports of the discovery of a large structure comprising at least 100,000 acres in southwestern Montana, a region heretofore passed up by oil men, has resulted in a rush into the district.

Early this year rumors of the presence of geologists working close to the Montana-Idaho boundary began to seep into the land departments of the oil companies, but nothing of a tangible nature was revealed until 2 months ago when applications for leases on approximately 20,000 acres of federal land were filed in the U. S. district land office. These filings were made by Russel E. Young, of Casper, a lease broker who formerly was connected with two major oil companies, and his associates. Scouts immediately were dispatched into the area by several of the major companies to check on what was taking place.

About the same time the Montana State Land Board was requested to put up for sale leases on state land in the district, and on October 8 the board accepted bids on 5,614 acres in 11 separate tracts. The minimum bid acceptable to the board was 75 cents an acre, but only one parcel, Tract 2, consisting of 640 acres in 36-14s-8w, went for the minimum, and was bid in by Young. The other tracts were sold for around $1.50 per acre, with the highest bid being $10.50 an acre for 640 acres in Sections 29, 32, and 33-14s-7w by Jeff Hawks, of Casper. The land involved in these transactions lies approximately 65 miles west of the Yellowstone National Park and 45 miles south of Dillon in Beaverhead County.

All of the oil and gas fields in Montana are located in what is known as the Montana Plains. The plains are separated from the western part of the state by the front range of the Northern Rocky Mountains which run in a general north and south direction through the center of the western half of the state. The region on the we has never been mapped by the U. S. Geological Survey, nor has it received much attention from any other source. Very few, if any exploratory wells have been drilled in the region and it is looked upon as virgin territory.

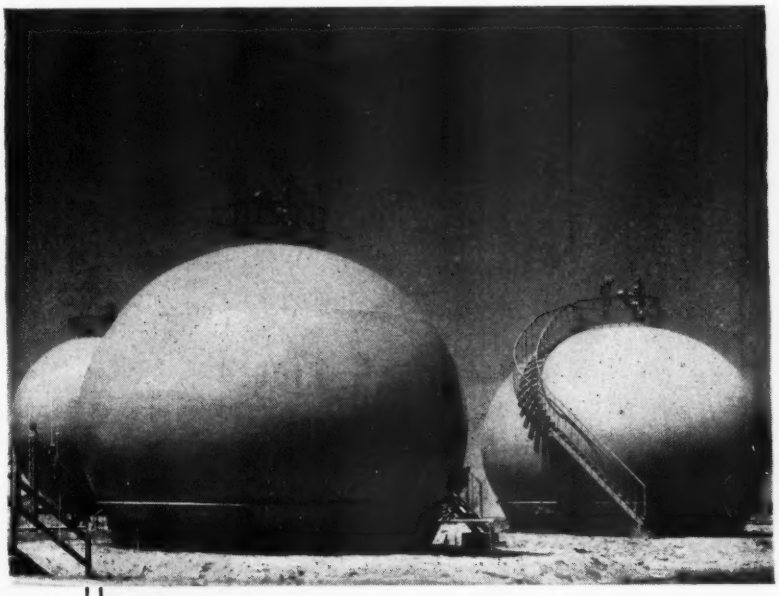
Interest in the area arises not so much out of the rumored discovery of a single structure but in the possibility that it may point to the opening up of a regional wildcat play that lies outside of the beaten path of the oil men. Topographical maps indicate the presence of a large basin 100 miles long and 100 miles wide entirely rimmed with high mountain ranges and similar, in many respects, to the Big Horn basin in northern Wyoming. Almost all of the oil fields in northern Wyoming, including Elk Basin, Frannie, Garland, Oregon Basin, and numerous others, are located on the outer edges of the basin not far distant from the mountains.

Starting near the center of Yellowstone National Park and running irregularly westward for approximately 90 miles is an arm of the Rocky Mountains which rise near the center to a Continental Divide. The mountains then trend northwestward for 70 miles along the Montana-Idaho boundary. Then they turn northeasterly in the direction of Butte and Helena until they join the ranges which form the western boundary of the Montana Plains, thus forming a large basin completely enclosed. What lies within the basin in the form of sedimentary beds is practically unknown except that Cretaceous formations are mostly at the surface with some Tertiary beds being exposed. Whether the basin is rimmed with structures similar to Big Horn basin, and will open an entirely new region for exploration is still a matter for the future to decide.

Elk Springs wildcat.—Continental Oil Co. 1 Smith SE SW 30-5n-98w, Elk Springs structure, Moffat County, Colorado, northeast of Rangely field, which had saturation in the top of the Weber sand at 6,087 ft., including 8 ft. of bleeding core, was coring ahead at 6,188 ft. at last report and preparing to make a drill-stem test. So far no water has been encountered in the first 100 ft. of the formation, and streaked saturation continued to show up in the cores, but company officials are on the conservative side and are not yet ready to say whether it will make a well. However, leasing is taking place all around the block, and it is estimated that at least 50,000 acres have been signed up.

Elk Basin Madison test.—Stanolind Oil & Gas Co. 38-M Unit SE NE 24-58-100w, a test of the Madison lime, is bottomed at 5,013 ft., 673 ft. in the lime, where it is conditioning hole. The perforations opposite the Tensleep have been squeezed off, and a 5½-in. liner will be set at 4,680 ft., 340 ft. in the formation. Top of the Madison has been corrected to 4,340 ft., following an electric survey, 10 ft. higher than reported from samples. First oil was encountered in the top of the formation.

Pure well at River Dome.—Pure Oil Co. 3 Unit SW SW 17-48-92, River Dome, Washakie County, Wyoming, 1 mile southeast of the discovery, which flowed 28 bbl. per day natural from the Embar, topped at 10,003 ft., was acidized with 1,000 gal., and flowed 160 bbl. 39°-gravity oil and 4,000,000



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cu. ft. of gas in 10½ hours through a ¼-in. choke. The second well was drilled 1½ miles north of the discovery.

Madison producing belt at Cut Bank narrowed.—Union Oil Co. 1 Superior SW NE 7-36-5w, Cut Bank field, encountered sulfur water in the Madison at 3,210 ft. and was abandoned at 3,250 ft. It is ½ mile east of the nearest producer in the lime in the northern group of wells, and 2 miles east of a dry hole on the west side, limiting the productive area of the lime to less than 2 miles from west to east.

New operations.—There were 16 new operations, of which 5 were in Rangely field in Colorado; one each in South Elk Basin and Little Buck Creek in Wyoming; 2 each in Kevin-Sunburst and Cut Bank; and 1 each in Cat Creek, Bowdoin, Dunkirk, Reagan, and Haymaker in Montana. The two last named were the only wildcats. The Reagan location is Montana Power Co. 1 Tribal-355 SE SE SW 10-37n-7w, in the Blackfeet Indian Reservation 1¾ miles south of the Canadian border and a little more than a mile north of the Ed Reagan discovery well in the Madison lime. The other is R. C. Tarrant 2 Williams in 21-9n-13e.

Completions.—Seventeen wells were completed, of which 8 were oil wells with initial production of 3,167 bbl. per day, 2 were gas wells, and 7 were dry holes. Colorado had five completions, all oil wells, of which four for 2,265 bbl. were in Rangely field, and one for 498 bbl. was in Iles field. Wyoming had four completions, of which one for 300 bbl. was an oil well in the Hamilton field, one was a gas well at Beaver Creek, and two dry holes, one in Lance Creek and a wildcat on the Lamb dome. Montana had eight completions, of which two were oil wells for 104 bbl., one was a gas well and five were dry holes. These were distributed four in Kevin-Sunburst, two in Cut Bank, and one each in Bowdoin and Pendroy district.

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HOBBS.—Humble Oil & Refining Co.'s 1 Northcutt, deep Curry County wildcat in 32-8n-37e, extreme northeast section of the county, reported streaks of granite wash in a core at 6,652-72 ft., and signs of the same material in drill cuttings at 6,928 ft. in lime and black shale. Another Curry County wildcat, some 20 miles southwest of the town of Clovis, H. W. Snowden 1 Garrett, 26-5n-34e, was fishing for stuck drill pipe in sandy lime at 2,525 ft.

Reports from Hot Springs, county seat of Sierra County, indicate considerable interest in a reported Pennsylvanian test by A. F. Garner, of Hot Springs and an unnamed group of Denver, Colo., oil men, who have assembled a block of approximately 5,000 acres in Township 12 South, Ranges 4 and 5 West. Geologists say the Pennsylvania should be found near 2,400 ft.

Location of the proposed test will be on a structure termed the Alamosa dome, near Cuchillo and some 6 miles northwest of Hot Springs, just off State Highway 52. If productive, this test will revive interest in the region covering parts of Sierra, Valencia, and Dona Ana counties, an area commonly referred to as the Rio Grande basin.

WYOMING WILDCAT FAILURE

Lamb, Big Horn County: Cities Service Oil Co. 1 Government, SE NE NE 13-51n-93w, TD 3,495 ft., top Tensleep 3,470 ft., water, plugged and abd.

MONTANA WILDCAT FAILURE

Pendroy District, Teton County: Jarvis & Marcell 1 Flannagan, C SW NW 8-27n-5w, TD 3,012 ft., Ellis-Madison contact 2,530 ft., sulfur water at 2,541 ft., plugged and abd.

SOUTH LOUISIANA

Seventh Producer in Mamou Field Flows 216 Bbl. Oil

NEW ORLEANS.—Magnolia Petroleum Co. brought in the seventh producer for the Mamou field in Evangeline Parish when its 1 Guillory-Landreneau Unit, SW SE 6-5s-1e, was completed flowing a potential of 216 bbl. of 47°-gravity oil per day through an 8/64-in. choke, gas-oil ratio 1,685 to 1, tubing pressure 1,250 lb., no water. This well was drilled to a total depth of 11,839 ft., with production through 24 perforations at 11,771-80 ft. Since this pool was opened in January of this year, there have been six wells drilled, all producers, and gaging an average initial production of 242 bbl. The discovery, Magnolia 1 J. B. Morein, was completed for an initial production of 208 bbl. per day, total depth 11,653 ft.

The second test in the Singer discovery area of Beauregard Parish, Magnolia 1 Newport Industries, 22-5s-11w, ¼ mile southwest of the 2-C Lutcher-Moore discovery well, has been completed as a dry hole at a total depth of 8,150 ft. with no shows. It will be used as a salt water injection well.

At Whitecastle field, Iberville Parish, Shell Oil Co., Inc., 35 Wilbert, 2-11s-12e, flowed 155 bbl. of 32°-gravity oil per day through a 22/64-in. choke, gas-oil ratio 390 to 1, tubing pressure 300 lb., casing pressure 750 lb. Total depth is 6,750 ft. with production from 6,564-70 ft.

Thirteen wells were completed, of which seven were oil wells with initial production of 1,038 bbl., and six were dry holes. The oil wells were as follows: Acadia two, Evange-

line one, Iberville two, Jefferson one, and St. Mary one, all development wells. There were two dry wildcats, one each in Cameron and Lafourche parishes. Only six new operations were reported this week, two in Jefferson Davis Parish, one development and one exploratory, and one each in Acadia, Calcasieu, Lafourche and Plaquemines parishes.

SOUTH LOUISIANA WILDCAT FAILURES

Cameron Parish: W. T. Burton 1 Lake-State, in lower Calcasieu Lake-14s-9w, dry, TD 8,477 ft. in salt.

LaFourche Parish: Union Oil Co. of Calif. 2 City of New Orleans, 24-23s-22e, in Bay Marchand area, dry, TD 11,233 ft. in salt, top salt 8,648 ft.

MISSISSIPPI

Mississippi, Alabama Exploratory Work High

JACKSON.—There was not much encouraging news from wildcats last week but exploration work in both Mississippi and Alabama is going at a good pace. In Mississippi 12 wildcats were drilling in 8 counties and in Alabama 11 wildcats were reported from 7 counties.

There is considerable activity in South Mississippi, with private operators as well as majors taking part in various fields, including Heidelberg, Eucutta, Baxterville, Gwinville and Cranfield. Gulf Oil Corp. was said to have 11 operations under way in the Heidelberg field of Jasper County. Production here is in the Eutaw around 5,000 ft.

Danciger Oil & Refining Co. last week reported its first oil well in Mississippi. It is the 1 Allen, Section 5-7n-7e, and is a southeast edge well of the Brookhaven pool of Lincoln County. Completion was in the Tuscaloosa sand, perforated at 10,260-10,316 ft., and flow was gaged at 422 bbl. of 39° oil in 16 hours through ¼-in. choke. Gas-oil ratio was 260 : 1.

In Leake County, Mississippi, Caraway and Travis' 1 Jim Kelly, 27-10n-8e, was drilling ahead at 5,819 ft. in Lower Cretaceous. The well logged top of the Massive at 5,098-5,123 ft., and recovered soft, white sand in a core at 5,100-10 ft., but no shows.

In Warren County, A. W. Hutchings, 1 Simrall, 18-18n-5e, logged the Wilcox at 2,936 ft., Midway 5,348 ft., chalk 6,070 ft., and the Eutaw at 6,586 ft. No shows of oil were reported.

ALABAMA WILDCAT FAILURE

Marengo County: Ballio & Trotter 1 Camillo B. Tutt, NW NE 32-14n-1e, dry, TD 4,557 ft., no tops reported.

CALIFORNIA

Kern County Test May Be Condensate Discovery

LOS ANGELES.—Probable discovery of a new pool on the Belgian anticline, a mile southwest of the McKittrick pool in Kern County, and completion of a deep Miocene producer in the Potrero area, near Inglewood, Los Angeles County, featured California operations last week.

The Belgian anticline discovery, The Texas Co. 1 Western Petroleum Co., 990 ft. north and west from the southeast corner of 29-30s-22e, is generally credited with having Oceanic sand from 5,144-73 ft. On formation test, the well showed estimated production of 8,000,000 cu. ft. of wet gas. The testing tool was open only 6 minutes and consequently the production of the

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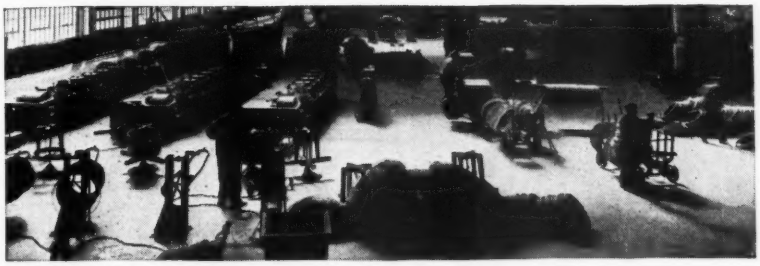

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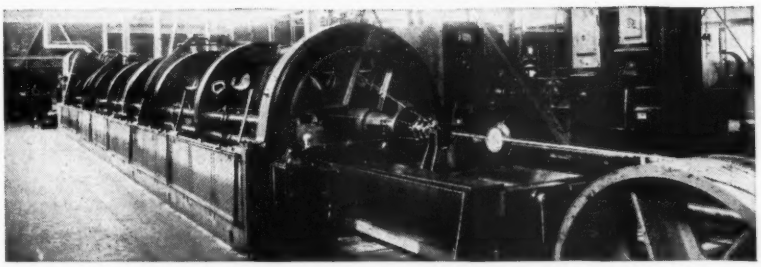

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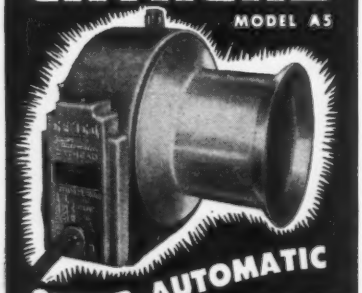

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well could not be accurately appraised. Cores did not disclose free oil but carried gasoline odor, possibly indicating condensate production. Operators cemented 7-in. pipe at 5,140 ft. after making the formation test. A more conclusive test is scheduled this week.

The Miocene producer in the Potrero area, near Inglewood, 12 miles southwest of the heart of Los Angeles, is Basin Oil Co. 1 Standard Brick, 130 ft. south and 200 west from the center lines of Hyde Park Boulevard and Eucalyptus Avenue, in 28-2s-14w. At end of last week, the well was flowing at the rate of 30 bbl. per hour, of 28° oil, cut 10 per cent, through 28/64-in. choke on 2½-in. tubing suspended at 9,889 ft. Pressures were 240 psi. on tubing and 500 psi. on casing. Top of the Miocene section was corrected to 8,400 ft. Operators set 7-in. at 9,935 ft. and completed with 529 ft. of 5-in., the lower 480 ft. of which was perforated. Total depth is 10,418 ft.

Two deep wildcat operations in the San Joaquin Valley continue to receive attention, although both reported only routine progress during the week. Pacific Western Oil Corp. 1 National Royalties, in 5-26s-22e, the state's deepest well, was last reported drilling at 15,675 ft. Loffland Bros. Co., the contractor, made 222 ft. of new hole during the week, and a new depth record for a contract-drilled hole is in prospect. Belridge Oil Co. 62-W-33, a deep test in the old South Belridge field, in 33-28s-21e, was delayed by a fishing job, but operators were ready to resume drilling after clearing the hole at 13,950 ft.

Richfield Oil Corp. completed several core holes in the vicinity of its projected deep test at South Belridge and prepared to resume drilling at 1 Berry, in 30-28s-21e, which was suspended at 4,485 ft., pending analysis of geological information obtained in the coring program.

Richfield abandoned another deep test in the East Los Angeles area during the week. Operations were suspended at 9,255 ft. at 1 Flood Control, in 14-2s-12w. Richfield prepared to start another well in the same vicinity, 3 Union Pacific Unit in 16-2s-12w.

In the Dominguez area, Los Angeles County, Union Oil Co. cored ahead at 58 Hellman, in 27-3s-13w, after a formation test at 9,487 to 10,023 ft. resulted in a blow of gas and recovery of 23 stands of mud and gassy water with a trace of oil on bottom. Coring is progressing below 10,261 ft.

Newly authorized locations in California declined to 29 during the past week, a reduction of 13 from the previous week. The new work is well scattered with three locations in the Richfield pool representing the greatest concentration.

SUCCESSFUL CALIFORNIA WILDCATS

Los Angeles County, Inglewood area: Basin Oil Co. 1 Standard Brick, 28-2s-14w; top Miocene 8,400 ft.; TD 10,418 ft.; flowing 30 bbl. per hour, 28°, 10 per cent cut.

CALIFORNIA WILDCAT FAILURES

Los Angeles County, East Los Angeles area: Richfield Oil Corp. 1 Flood Control, 14-2s-12w; dry, TD 9,255 ft.

Orange County, Costa Mesa area: M. R. & M. Syndicate 1 Capron, 17-6s-10w, gray sand, dry; TD 4,609 ft.

San Joaquin County, Victoria Island area: Amerada Petroleum Corp. 1 Borden, 33-1n-4e, top McDonald Island, 5,862 ft.; top Green sand, 5,175 ft.; dry; TD 6,000 ft.

Kings County, Pyramid Hills area: Glenn Dial 1 Miller, 13-24s-17e, top McClure, 1,470 ft.; dry; TD 2,385 ft.

Buttes County, Chico area: Standard of California 1 Odell, 9-20n-1e, dry, TD 3,500 ft.

Ventura County, Tip Top area: L. M. Lockhart 1 Macrate, 27-4n-23w, dry; bottomed in Vaqueros topped at 6,450 ft.; fault zone at 3,478; top Murdock 4,760; TD 6,713 ft.

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LA.-ARK.

Bossier Wildcat Completes As Small Pumper

SHREVEPORT.—Barnsdall Oil Co. and Sohio Petroleum Co.'s Bossier Parish wildcat, the 1 Carter-Burton in NW NW 26-23n-13w, was completed in Tokio sand at 3,228-65 ft. where it pumped 33 bbl. of 41°-gravity oil after drilling to total depth of 12,386 ft. in salt, then plugging back to 3,275 ft. After setting 7-in. casing at 10,640 ft., perforations were made in Cotton Valley at 9,950-10,000 ft., recovering gas-cut mud and water. Shots in the Travis Peak at 7,090-7,100 ft. also recovered mud and water. Perforations in the Pettit at 6,322-6,405 ft. swabbed 50 bbl. of fluid a day, of which 50 per cent was 40°-gravity oil and 50 per cent water.

ARKANSAS WILDCAT FAILURES

Lafayette County: W. G. Ray and W. C. Woolf 1 W. Kitchens, N/2 SE NW SE 17-15s-22w, dry, TD 3,705 ft., Midway 1,040 ft., fault 1,050 ft., Nacatoch 1,240 ft., Basal Annona 1,912 ft., Tokio 2,274 ft., Lower Cretaceous 2,571 ft., Massive anhydrite 2,624 ft., Basal Massive anhydrite 2,724 ft., James 3,139 ft., Pettit 3,319 ft., Travis Peak 3,455 ft.

Little River: R. W. O'Meara et al 1 Ed Woods, NW NW SE SW 7-14s-28w, dry, TD 5,564 ft., Basal Annona 1,120 ft., Paluxy 2,020 ft., Glen Rose 2,870 ft., anhydrite 2,980 ft., Massive anhydrite 3,200 ft., 3,105 ft., Basal Massive anhydrite 3,200 ft., Travis Peak 3,820 ft., Cotton Valley 4,530 ft., Buchrange 5,150 ft., Smackover 5,260 ft.

NORTH LOUISIANA SUCCESSFUL WILDCAT

Bossier Parish: Barnsdall Oil Co. and Sohio 1 Carter-Burton, C NW NW 26-23n-13w, discovery well Plain Dealing, pumped 33 bbl. of 41°-gravity oil per day from Tokio at 3,228-65 ft.; Base Annona 2,678 ft., 1st anhydrite 4,988 ft., Massive anhydrite 5,170 ft., Basal Massive anhydrite 5,405 ft., Pettit 6,332 ft., Travis Peak 6,522 ft., Cotton Valley 8,228 ft., sand 8,940 ft. with odor and stain of oil, Bromide sand 9,660 ft., TD 12,386 ft.

KANSAS

Pratt County Test Recovers Oil-Cut Mud From Lansing

OIL-CUT mud was recovered last week in a drill-stem test of the Lansing lime at 3,677-84 ft. at the Sohio Petroleum Co. et al 1 Stalcup, NE NE NE 15-26-12w, Pratt County wildcat north of production in the Carmi pool. The well, now at the 3,900-ft. level, will be drilled ahead to the Arbuckle before a test is made of the shows encountered in the Lansing.

Doley Oil Co. has plugged back to test good shows of oil found in the Lansing lime at 3,300 ft. at the 1 Henderson, SW SW NW 23-10-19w, wildcat 1 mile southwest of the Vohs pool of Rooks County. Heavy oil was found in the Arbuckle at 3,679-3,700 ft.

Stanolind Oil Co. has run casing at 6,000 ft. at the 2 Adams, NE NE SW 9-35-30w, to test a show of oil and gas encountered in the upper section of the Mississippi at 5,810-62 ft. The 2 Adams, a Meade County wildcat, is approximately 1½ miles east of an 80,000,000 cu. ft. gas discovery drilled last year.

KANSAS WILDCAT FAILURES

Marion County: Aladdin Petroleum 1 Weyand, SE SE NW 22-19s-1e, dry, TD 3,484 ft., Topeka 1,700 ft., Heebner 2,032 ft., Lansing-Kansas City 2,192 ft., Mississippi lime 2,836 ft., Kinderhook 3,040 ft., Viola 3,290 ft., Simpson 3,374 ft., Arbuckle 3,448 ft.

Rice County: Royer & Farris 1 Wilkey, NW NW SE 4-21s-8w, dry, TD 3,534 ft., Lansing-Kansas City 2,917 ft., cherty conglomerate 3,272 ft., Viola 3,382 ft., Simpson sand 3,450 ft., Arbuckle 3,524 ft.

OHIO, KENTUCKY

Clinton Gas Pool Widened Eastward by Ohio Fuel Well

COLUMBUS.—The Clinton gas pool at Tropic in western York Township, Morgan County, was widened ⅛ mile to the east by Ohio Fuel 1-C C. L. Weaver, Section 35. Clinton, topped at 3,756 ft., gaged 3,950,000 cu. ft. of gas natural, 32 ft. in.

Indications of a new Injun sand pool were found by Fisher White et al, on Charles Howell in Section 30, Adams Township, Monroe County. Top of the Injun sand was found at 1,251 ft. Drilling stopped at 1,287 ft. with an open flow of 1,500,000 cu. ft.

Ohio Fuel 1 Bradstock-Knapp, Lot 3, Penfield Township, Lorain County, extended the Middle Wellington pool ⅛ mile to the east. A stray Clinton, topped at 2,419 ft., was drilled to 2,428 ft. with a gage of 3,720,000 cu. ft.

Locations continue to exceed completions indicating no seasonal drop in drilling activity will be felt for some time. Ashland field led in locations reported with 12,

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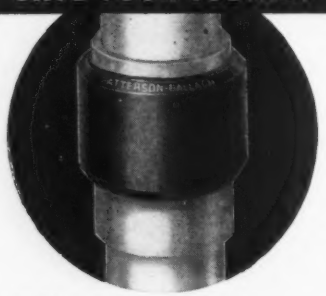

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followed by Cambridge with 9, Lancaster 7, Sandyville (Canton) 4, and Stewart 3. Twenty-nine wells were completed.

WESTERN KENTUCKY

OWENSBORO.—Fox & Fox Drilling Co. has opened a new oil field 3 miles east of the Birk City pool with the 1 P. R. Grant, 15-P-28, Daviess County wildcat. On initial test the well gaged 75 bbl. of oil and 1,000,000 cu. ft. of gas daily from the Tar Springs sand at 1,225-40 ft., total depth 1,935 ft.

A 1½-mile west extension of the Poole pool, Henderson County, is indicated by the Carter Oil Co. 1 W. B. Adams, 4-N-23, where pipe has been set to test the Cypress sand at 2,226-53 ft., total depth. A 2-hour drill-stem test at 2,221-34 ft. recovered 1,650 ft. of clean oil and no water, while a 2-hour drill-stem test at 2,221-53 ft. got 1,830 ft. of oil, 180 ft. of mud heavily cut with oil and 60 ft. of salty oil-cut mud.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

Daviess County: Fox & Fox 1 P. R. Grant, 15-P-28, flowed 75 bbl. oil and 1,000,000 cu. ft. gas, Tar Springs 1,225-40 ft., elev. 384 ft., TD 1,935 ft.

EASTERN KENTUCKY

ASHLAND.—With several dry holes noted in Eastern Kentucky activities during the past week, one completion from Knott County constituted the principal work.

Kentucky-West Virginia Gas Co. completed well No. 5677 on the Benjamin Smith property, total depth 2,672 ft., with 84,000 cu. ft. in shale.

INDIANA

EVANSVILLE.—Calvert & Willis 1 Fred Wiley, SW SW NE 18-5s-13w, Posey County discovery 1½ miles from production in the New Harmony field, has been put on pump for a test of the McClosky lime at 2,970-77 ft., total depth 3,023 ft. No pump gage is yet available, although the well previously swabbed at the rate of 350 bbl. of oil daily.

Indiana completions remained at a relatively high level during the past week with four oil wells and seven dry holes reported, one of the latter being a wildcat. Seven new operations were announced during the week.

INDIANA WILDCAT FAILURE

Posey County: National Associated Petroleum Co. 1 Malcolm Fuhrer, NW SE NW 34-5s-14w, elev. 485 ft., dry at 3,053 ft.

ILLINOIS

Several New Fields In Prospect for State

MATTOON.—Several new oil strikes were indicated last week by preliminary tests made at various wildcats drilling throughout the Illinois basin. First of these was the Texas Co. 1 E. E. Hines "C," SE SE SE 1-1s-9e, Wayne County wildcat 3 miles southwest of production in the Bennington field. Here a drill-stem test of the Rosiclare lime at 3,254-62 ft., total depth, resulted in the recovery of gas in 7 minutes and a flow of clean oil in 43 minutes. Tanks are now being set preparatory to making production tests.

In Wabash County, about 1 mile east and slightly north of production in the Browns pool, the Gilliam-Aspin Drilling Co. is setting pipe on good oil saturation found in the Levias lime at the 1 H. L. Herring, NE NE NW 27-1s-14w. Saturation was encountered at 2,965-69 ft., total depth 2,971 ft., and a 1-hour drill-stem test showed gas in 4 minutes and recovered 2,550 ft. of clean oil.

(Completions will be reported next week).

OKLAHOMA

Payne County Wildcat May Open New Bartlesville Pool

FLEET DRILLING CO. et al last week succeeded in killing the gas flow and placing an 80-qt. shot in the Bartlesville sand at 3,934-50 ft. at their Payne County prospect, the 1 Ball, NE NE SW 10-18n-3e. The 1 Ball encountered sand at 3,927-54 ft., and pipe was cemented at 3,924 ft. In 3 days of swabbing, the well averaged 26 to 29 bbl. of oil per day along with about the same amount of water. A 5-ft. plug was placed on bottom to shut off the water before placing the shot.

A new pool has been opened in Seminole County by the Manahan Oil Co. 1 Harris, NE SE SW 21-8n-7e, wildcat in the Little River area. After testing the Booch sand, where it swabbed about 12 bbl. of oil daily following shot, the well was deepened to 3,303 ft. in the Gilcrease sand, topped at 3,288 ft. Liner was run to 3,289 ft. and the well is flowing at the rate of 7 bbl. of oil per hour and 6,500,000 cu. ft. of gas daily.

Oklahoma Natural Gas Co. is preparing to plug back again at its eastern Dewey County wildcat, 1 Oakwood Unit, NW NW NW 6-17n-14w. Hole will be plugged back to 7,900 ft. to test shows encountered in the Layton sand. It was originally drilled to a total depth of 12,610 ft. in the Wilcox and plugged back to test a small showing of gas and distillate encountered at 8,890-8,910 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Hughes County: Sunray 1 W. J. Albright, SE SW SE 11-7n-9e, flowed 82 bbl. of 39°-gravity oil per day from Booch at 2,884-98 ft.; Seneca 1,017 ft., Allen sand 1,140 ft., Thurman 1,855 ft., brown lime 2,595 ft., TD 2,898 ft.

Lincoln County: Mulberry Oil 1 Nauman,

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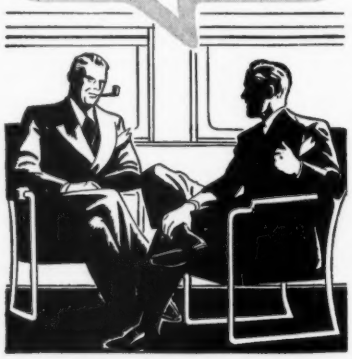

SEE PAGE 58

SE NW SE 2-17n-5e, discovery well, flowed 1,900,000 cu. ft. gas per day from Prue at 3,057-87 ft.; Oswego 2,945 ft., Verdigris 3,160 ft., Inola 3,280 ft., Red Fork 3,330 ft., Bartlesville 3,425 ft., Mississippi lime 3,609 ft., Viola 3,878 ft., 1st Wilcox 3,924 ft., 2nd Wilcox 3,950 ft., TD 3,979 ft.

Olson Drilling 1 E. E. Maston, NW SE SW 35-14n-4e, discovery well, produced 3,360,000 cu. ft. gas per day from Calvin at 3,007-22 ft., TD 3,022 ft.

Noble County: P. T. Eason Co. and Midland Co-op 1 Carter-Boyes, SE NE SE 19-22n-1w, discovery well, flowed 128 bbl. of 41°-gravity oil per day through ½-in. tubing choke from Mississippi

(Continued on page 172)

SUMMARY OF SEPTEMBER COMPLETIONS

	Comp.	Oil	Prod.	Gas	Dry	Under 1,000 ft.	1,000-2,500 ft.	2,500-5,000 ft.	5,000-10,000 ft.	Over 10,000 ft.	Total footage	Rigs and drilling
New York	127	63	119	0	*64	0	127	0	0	0	183,096	158
Pennsylvania	319	161	564	34	†124	23	262	34	0	0	472,133	236
West Virginia	74	6	21	58	10	4	43	22	5	0	189,088	234
Ohio	118	33	782	49	36	11	43	64	0	0	320,192	233
Indiana	41	23	2,420	0	18	4	30	6	1	0	85,216	60
Kentucky	32	11	702	9	12	5	16	11	0	0	58,134	81
Illinois	276	146	16,106	2	128	11	84	181	0	0	716,705	256
Michigan	75	24	1,533	18	33	0	51	22	2	0	154,153	105
Kansas	157	76	20,340	31	‡50	1	12	144	0	0	499,632	335
Neb., Mo., Iowa	0	0	0	0	0	0	0	0	0	0	0	14
Oklahoma	285	156	19,780	31	§98	15	107	129	33	1	840,736	513
Texas	607	376	103,270	33	198	35	144	218	195	15	2,606,941	1,012
North	155	87	16,933	2	66	24	64	48	19	0	413,803	140
West Central	71	30	2,582	5	36	3	35	32	1	0	174,320	56
West	144	118	63,188	1	25	5	28	54	50	7	722,968	289
Panhandle	26	15	1,444	10	1	0	1	25	0	0	79,707	96
Eastern	45	27	6,086	6	12	0	2	23	20	0	227,391	113
Upper Gulf Coast	62	42	6,000	4	16	0	2	11	43	6	443,972	118
Lower Gulf Coast	66	46	5,955	4	16	0	0	10	54	2	417,271	129
South	20	6	922	1	13	0	5	9	6	0	80,608	33
South Central	18	5	160	0	13	3	7	6	2	0	46,901	38
Louisiana	109	62	9,942	10	37	1	21	42	28	17	593,574	232
Northern	73	42	6,625	9	22	1	21	40	11	0	257,239	101
Southern	36	20	3,317	1	15	0	0	2	17	17	336,335	131
Arkansas	17	7	821	1	9	0	4	7	6	0	74,738	25
Mississippi	22	12	3,695	1	9	0	0	4	14	4	159,532	51
Ala., Ga., Fla.	4	1	527	0	3	0	0	1	2	1	26,542	8
Montana	30	16	874	10	4	6	14	8	1	1	65,891	71
Wyoming	12	8	2,379	1	3	0	3	6	3	0	43,375	76
Colorado-Utah	20	18	7,089	0	2	0	0	1	19	0	127,823	76
New Mexico	43	34	13,889	3	6	2	7	18	16	0	186,631	93
California	152	116	29,264	8	28	11	38	64	35	4	581,082	203
Total September	2,520	1,349	234,117	299	872	129	1,006	982	360	43	7,985,214	4,072
Total August	2,563	1,407	274,151	258	898	110	964	1,018	412	59	8,647,390	3,808

Service wells, 4 weeks ending September 28, 1946: *64, †118, ‡1, §7.

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Among the Drilling Contractors

Morris & Meredith, Inc., Houston, have contract to drill a 10,500-ft. test for Fidelity Oil & Royalty Co. in Section 254, T. & N. O. Railroad Co. Survey, Jefferson County, Texas, location to be known as 1 Hebert Trust et al. It is approximately 3 miles southeast of the Seabreeze field.

Slaubaugh Brothers, Montgomery, Ind., will drill on contract the Hoosier Gas Corp. 7 Franklin A. Schrolucke, in NW NE 18-1n-6w, Pike County, Indiana.

Newton Barret Drilling Co. is starting the first offset to the discovery completed recently by Fred Morgan, 3 miles northwest of Chandler, Okla. The well is the 1 Hopkins and location is in SW SW NE 6-14n-4e, Lincoln County.

Olsen-Blount Drilling Corp. was drilling at 5,970 ft. in shale at the 1 Mee, in SE SE 4-12n-4w, Oklahoma County, Oklahoma.

Kiowa Drilling Co. has been contracted by The Texas Co. to drill the 1 Dreiling, SW SW SW 15-13-17w, Ellis County, Kansas. The test is located approximately ½ mile southeast of Catherine in the east central part of the county, and is on a block of 2,000 acres.

Sterling Drilling Co. recently has taken leases on SW of 9, NE of 17, and NW of 20-18s-14w, Barton County, Kansas. These leases are along a trend southwest from the Boyd pool, and were the choicest openings available in a locality closely leased by several major companies.

Noble Drilling Co. is contractor for Standard Oil Co. of New Jersey 1 Esso-Maryland, wildcat in the vicinity of Ocean City, Worcester County, and near the most extreme eastern point of Maryland. The well will be drilled to 5,000 ft., and possibly deeper depending on the geological sections penetrated. This is the second exploratory test of the Atlantic Coast drilled for Standard by Noble, the first being a 10,054-ft. dry hole at Cape Hatteras, N. C.

Big Chief Drilling Co. will drill the 1 Blackwood, NE NW SW 6-4n-1w, wildcat in Garvin County, Oklahoma. The test, which is being initiated jointly by Big Chief and the Sunray Oil Corp., is contracted to 6,500 ft.

J. C. Hyde, drilling contractor in the Permian basin, has purchased a home in Midland, Tex., and will make that city his new headquarters. He has been active as a drilling contractor in the Abilene-Breckenridge, Tex., area for the past 20 years.

West Central Drilling Co. has made location for a 4,500-ft. rotary wildcat 15 miles southwest of Merkel, in the old Army Camp Barkeley maneuver area of Taylor County, West Central Texas. Location is in Section 16, Block

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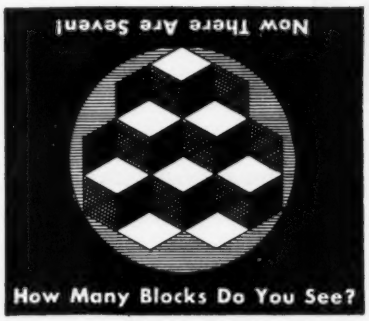

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5, T&P Survey. Same contractor's 5 J. P. Ingram (formerly Comanche Oil Corp. et al), reported a light show of oil in Cook lime at 2,650-55 ft. Location is in Section 18, Grimes County School Land, Taylor County, and if productive, will extend the Ingram pool to the southwest.

Gibson Drilling Co., Los Angeles, is the contractor selected to drill a new series of wells for Signal Petroleum Co. of California, Ltd., on its Collen lease in the West Newport Beach field, Orange County, California.

William De Koch, president of K. de K. Drilling Co., operating in the Lloydminster, Alberta field, Canada, left recently to spend the winter in his home in California. Until his return, operations of the company will be handled by C. B. Barlow.

Olson Drilling Co. has contract to drill Plymouth Oil Co. 1 R. B. Cowden, Section 1, Block 45, TP Survey, just inside the south line of Andrews County, West Texas. The test will go to around 9,000 ft. to test the Lower Ordovician section.

K. L. Kellogg & Sons, Long Beach, has been awarded contract to drill Union Oil Co. 50, 51 and 52 Chapman, all in 29-3s-9w, in the Richfield pool, Orange County, California.

Gibson Drilling Co., Los Angeles, is to drill Standard Oil Co. of California 1 Deeble-Smith, 13-6s-11w, a projected wildcat test to depth in the Huntington Beach area, Orange County, California.

Buaas Drilling Co., Bakersfield, is preparing to start several wells in the Cymric field, Kern County, California, for Standard Oil Co. of California. Locations authorized are in 31-29s-22e.

Gene Reid Drilling Co., Bakersfield, is to drill 7 Beer for Hamilton & Sherman in 19-26s-19e, in the Blackwells Corner area of Kern County, California. The contracting firm has another rig engaged at Blackwells Corner on Amerada Petroleum Corp. 3 General, 19-26s-19e.

Drilling & Exploration Co., Los Angeles, is preparing to start two wells for Lloyd Corp. in the Ventura Avenue area, Ventura County, California.

E. F. Moran, Evansville, Ind., will drill on contract the Carter Oil Co. 1 William Steckler, in NW SE 1-1s-12w, Knox County, Indiana.

Jackson & Baker, Petersburg, Ind., has been awarded drilling contract on the Luther McIntosh 1 Victor Wilson, in NW SE 23-1n-9w, Pike County, Indiana.

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PERSONALS

21 Year's Experience Back of Texas Co. Official

EXPERIENCE of 21 years in all phases of petroleum and engineering fortifies J. H. Puls of Los Angeles for increased responsibilities recently assigned to him. He was promoted to assistant manager of the producing department for The Texas Co., Pacific Coast division, early in October.

Puls was first employed by The Texas Co. in 1925 in refinery and pipe-line engineering operations, following his graduation from the California Institute of Technology with a degree in mechanical engineering.

In 1937, he was placed in charge of mechanical and production engineering at Long Beach and, 3 years later, he was transferred to Los Angeles as division engineer. In this capacity, Puls was in charge of the civil, production, and development engineering staff for the Pacific Coast area. He became division superintendent of drilling and production in December 1944, succeeding W. H. Farrand.

J. D. Bryan, geophysical engineer, will leave soon for Port Moresby, New Guinea, to make a preliminary survey of oil deposits on that island. He is now in Houston for a refresher course and instructions from Robert H. Ray Co.

Raul Hansen and **Nobel Munzo,** representatives of the Argentine Government, visited Tulsa last week to examine geophysical equipment which may be purchased by Argentine. They plan to tour the oil-field manufacturing centers in Texas and California before returning to Argentina.

W. F. Herbert, recently transferred from Fort Worth to Houston as division petroleum engineer in the South Texas division for The Texas Co., was honored last week with a dinner by the Petroleum Engineers Club of Fort Worth.

Charles Renfroe, formerly with Superior Oil Co., has been appointed an instructor in the geology department at Oklahoma University.

W. J. Barrett, assistant district production superintendent in Florida for Humble Oil & Refining Co., is on an inspection tour of the company's Permian basin producing operations. Prior to his assignment in Florida, he was with Humble in Louisiana for 10 years.

D. O. Swan has been appointed head of the new petroleum technical-service department at the Baton Rouge, La., refinery of Standard Oil Co. of New Jersey, Louisiana Division. The department was formerly known as the process-control laboratory.

Charles M. Volpe, district civil engineer at Midland, Tex., for The Texas Co., will leave New York October 28 for Bogota, Colombia, where he will be superintendent of transportation for Texas Petroleum Co., a Texas Co. affiliate.

M. R. Thomas, assistant director of the French fuel-purchasing commission in the United States, visited major oil companies in Tulsa last week to arrange oil purchases. He is on a tour of oil-producing areas of the United States.

Richard J. Dearborn, of Texaco Development Corp., has been appointed to the newly established civilian Naval Research Advisory Committee by **James Forrestal,** secretary of the Navy.

Dr. Paul H. Price, West Virginia state geologist, will speak October 30 before the Houston Geological Society on "Evolution of Geologic Thought in Prospecting for Oil and Natural Gas." His talk is one of a series sponsored by the distinguished-lecture committee of the American Association of Petroleum Geologists.

Robert Gottschalk, former patent counsel in Chicago, has joined Standard Oil Co. (Ind.) as assistant manager of the development and patent department.

Alec Crowell, director of the Mississippi Oil and Gas Engineering Committee, conferred in Washington recently with **Ralph K. Davies,** acting director of the Oil and Gas Division, Department of the Interior, concerning the book on developments in petroleum technology to be published by the Interstate Oil Compact Commission. From Washington he was to go to New York to consult with officials of Standard Oil Co. (N. J.)

Chester F. Barnes, geologist for Cosden Petroleum Corp., has resigned to open an office as a consulting geologist in Big Spring, Tex.

RAY E. MILLER

Ray E. Miller, new director of sales for Du Pont's petroleum chemical division, and **Emory M. Fanning,** sales manager of the division, were in Tulsa recently in the course of a survey of the outlook for distribution and sales of Du Point's line of chemicals for the petroleum industry. The survey included visits to Chicago, San Francisco, Houston, Tulsa, and St. Louis. Du Pont is planning by early 1948 to begin marketing tetraethyl lead for the refining industry.

Melvin L. Rufer, general credit manager of Standard Oil Co. (Ind.), has been appointed assistant treasurer of the company.

Sam Lucas, of The Texas Co., has been elected president of the newly organized Oil Men's Club of Houston. **Fred J. Shipley,** of the gas and oil division of the Texas Railroad Commission, has been named secretary-treasurer of the club.

Harry A. Brown, superintendent of Frontier Refining Co. refinery at Cheyenne, who came to the company from Universal Oil Products Co. several months ago, has been put in charge of all of the company's activities in Cheyenne under the direction of Vice President W. R. Newman.

Louis F. Lockard will leave for South America early in November where he will become a party chief for Seismograph Service Corp. of Delaware in Colombia.

Emmett A. Finley, formerly stationed at Jackson, Miss., has gone to Venezuela where he joined Creole Petroleum Corp. as field geologist in Caracas.

James T. Collins, formerly employed at Cambridge, Md., was to leave the United States late in October for Aruba, N.W.I., to join Lago Oil & Transport Co. as a chemist at its Aruba refinery.

Allan A. McDonald, formerly with Carter Oil Co. in its domestic exploration work, has been transferred to Peru where he joined a Carter overseas exploration party as a magnetometer operator. **Louis C. Marlane** and **William L. Fouche,** both formerly employed on domestic crews, have been transferred to Venezuela to join exploration parties.

Martin Jones, member of the legal staff of Creole Petroleum Corp. with headquarters in Caracas, Venezuela, is spending his vacation in the United States and visiting relatives in Tulsa.

Dr. Frederick D. Rossini, chief of the thermochemistry and hydrocarbons section of the National Bureau of Standards, has been elected president of the standing committee of the International Union of Chemistry. Dr. Rossini is an authority on thermochemistry and the physical chemistry of hydrocarbons.

Mahlon A. Munday has left the United States for Colombia to join Tropical Oil Co. as a drilling foreman. Munday formerly was stationed at Sandia, Tex.

L. H. Wright, manager of the Philgas wholesale division for Phillips Petroleum Co., and **Dr. C. C. Crawford,** manager of the product development division, have been promoted to assistant managers of the chemical-products departments. Wright will be in charge of the Philgas wholesale, industrial, and retail divisions, and Crawford will head special products and product development. **Dr. A. J. Dirksen** succeeds Crawford as manager of the product development division.

R. H. Trumpeter, scout for Shell Oil Co., Inc., at Las Animas, Colo., has been named president of the newly organized Colorado Oil Scouts Association, which holds regular check meetings at Colorado Springs each Thursday. Bea McCune, of California Co., was elected secretary-treasurer.

Shifts

R. H. Zinszer, engineer, Union Oil Co. of California, Santa Fe Springs, Calif., to Santa Paula, Calif.; **E. L. Eppinger,** superintendent, Helmerich & Payne, Inc., Hobbs, N. M., to Odessa, Tex.; **L. K. King,** geologist, Continental Oil Co., Carlsbad, N. M., to Gainsville, Tex.; **H. E. Prokesh,** geologist, Continental Oil Co., Bowie, Tex., to Henrietta, Tex.; **E. D. Watson,** engineer, Shell Pipe Line Co., Nacagdoches, Tex., to Douglass, Tex.; **T. S. Green,** foreman, Republic Exploration Co., Floresville, Tex., to Sequin, Tex.; **Cecil Louks,** superintendent, Lone Star Producing Co., Marshall, Tex., to Carthage, Tex.; **Conrad C. Dye,** engineer, Stanolind Oil & Gas Co., Alvin, Tex., to Woodsboro, Tex.; **William F. Neale, Jr.,** engineer, Magnolia Petroleum Co., Dallas to Austin, Tex. **John R. Bradford,** geologist, United Geophysical Co., Inc., Lubbock, Tex., to Seagraves, Tex.; **C. Stewart Noland,** geologist, Skelly Oil Co., Midland, Tex., to Abilene, Tex.; **E. K. Arnett,** engineer, Phillips Petroleum Co., Phillips, Tex., to Borger, Tex.; **Charles H. Ise,** geologist, Sinclair-Prairie Oil Co., Wichita Falls, Tex., to Pecos, Tex.; **David C. Shaeffer,** foreman, Pasotex Pipe Line Co., Wink, Tex., to Iraan, Tex.; **H. E. Denzler, Jr.,** engineer, California Co., Gretna, La., to Harvey, La.; **C. W. Hemmi,** geologist, Petty Geophysical Engineering Co., Tallulah, La., to Greenville, Miss.; **Harold A. Burt,** superintendent, Westgate Greenland Oil Co., Shreveport, La., to Kansas City, Mo.; **Thomas J. E. Jobin,** engineer, Phillips Petroleum Co., El Dorado, Ark., to Quincy, Ill.; **F. M. Beal,** engineer, Carter Oil Co., Altamont, Ill., to Mattoon, Ill.; **B. W. Nedbalek,** engineer, Texas Pipe Line Co., Bloomington, Ill., to Tulsa; **Ed Morris,** superintendent, Farm Bureau Oil Co., Mount Vernon, Ind., to Henderson, Ky.; **Arthur C. Boyce,** vice president, Darbey Petroleum Corp., Monterey, Mass., to New York; **W. W. Lake,** engineer, Monsanto Chemical Co., St. Louis to Clarksburg, W. Va.

R. F. Cecalek, foreman, Gulf Refining Co., Cincinnati to Cleves, Ohio; **Herbert W. Wilker,** foreman, Standard Oil Co. (Ind.), Council Bluffs, Iowa, to Sauk Center, Minn.; **Walter J. Crooks, Jr.,** engineer, Humble Oil & Refining Co., Iola, Kans., to New Orleans; **H. V. Anderson,** superintendent, Cities Service Oil Co., Casper, Wyo., to Pampa, Tex.; **E. P. Heath,** superintendent, Sunray Oil Co., Oklahoma City to Bushton, Kans.; **John W. Rowland,** superintendent, Sinclair-Prairie Oil Co., Wewoka, Okla., to Pampa, Tex.; **A. E. Waerheide, Jr.,** engineer, Shell Oil Co., Inc., Tulsa to Wichita Falls, Tex.

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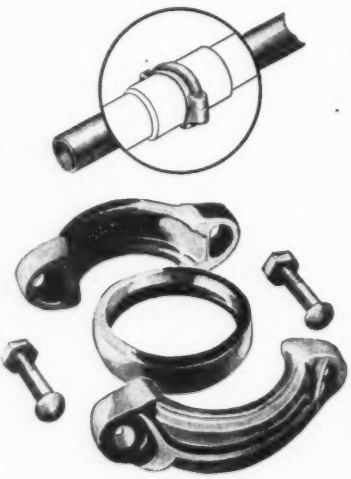

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Oklahoma Fields

(Continued from page 167)

lime at 4,798-815 ft., Pawhuska lime 1,223-70 ft., Upper Hoover 2,304 ft., Lower Hoover 2,507 ft., Avant 3,346-70 ft., Upper Layton 3,703-24 ft., shale 3,724-30 ft., Lower Layton 3,730-802 ft., Oswego 4,216 ft., lime 4,224-308 ft., Woodford 4,996 ft., dense 5,030 ft., sandy dolomite 5,055 ft., Wilcox 5,084-106 ft., dolomite 5,132 ft., 2nd Wilcox 5,167 ft., TD 5,183 ft.

Stephens County: Gulf 1 Doma, SW SW SW 11-1s-5w, discovery, flowed 400 bbl. of 27.8°-gravity oil per day through 1-in. tubing choke from sand at 4,138-893 ft., sand 2,160 and 4,063 ft., Dornick Hills 4,735 ft., sand 4,788 and 5,015-114 ft., TD 5,453 ft.

OKLAHOMA WILDCAT FAILURES

Cotton County: L. H. Choate 1 H. Benson, NW NW SE SW 22-4s-11w, dry, TD 2,501 ft., sand 1,375-90 ft., 1,681-87 ft. and 1,767-86 ft.

Roy L. Foster 1 Butler, SE SE SW SE 24-3s-11w, dry, TD 2,105 ft., no tops reported.

Jobe & Bunnell 1 J. M. Parrish, NW NW SE 31-2s-11w, dry, TD 2,222 ft., no tops reported.

Neeld & Hood 1 Bone, NE NE SE SE 8-4s-10w, dry, TD 1,758 ft., no tops reported.

Teaman & Brown 1 Creswell, NW NW NW NE 17-4s-10w, dry, TD 1,510 ft., no tops reported.

Garvin County: Anderson-Prichard 1 Jones, NE SE NW 30-1n-1e, dry, TD 2,015 ft., hard white tight sand 690-700 ft., 710-20 ft., 740-50 ft., 830-80 ft. and 900-30 ft., shale 1,130-2,015 ft.

Hughes County: Bert Fields 1 Long, NE NE NE 9-8n-9e, dry, TD 3,443 ft., Union Valley 3,390 ft., Cromwell 3,410 ft.

Jefferson County: D. D. Alexander 4 Western-Southern Life, NE SE SE SW 29-6s-7e, dry, TD 900 ft., 1st Arbuckle sand 738 ft. with a show of gas and salt water, black shale 748-60 ft., Arbuckle sand 760-70 ft., yellow shale 770-835 ft., black shale 835-900 ft.

Kingery Brothers 1 S. V. Smith, SW SW SE 10-4s-9w, dry, TD 2,905 ft., sand 670-710 ft., 945-62 ft., 1,003-17 ft., and 1,397-406 ft., shale and sand 1,500-35 ft., sand 1,535-47 ft., shale and sand 1,547-75 ft. and 1,575-730 ft., broken sand 2,135-45 ft., sand and shale 2,150-80 ft., sand 2,230-95 ft., broken lime 2,347-75 ft., red hard granite 2,530-40 ft., lime 2,879-95 ft., sand 2,895-905 ft.

Kay County: Texas 1 A. Kahle, NE SW SW 18-28n-2e, dry, TD 4,205 ft., Pawhuska 1,985 ft., Oread 2,233 ft., Endicott 2,258 ft., Perry 2,443 ft., Peoples 2,858 ft., Big lime-Oswego 3,260 ft., Mississippi lime 3,640 ft., Wilcox 3,937 ft., Tyner 3,987 ft., Arbuckle 4,091 ft.

E. Wakefield 1 Henke, NE NE SE 31-25n-1w, dry, TD 4,425 ft., Mississippi chat 4,264 ft. with show of oil, Basal chat 4,287 ft.

Logan County: Sun and Skelly 1 Donehue, SW SW NE 11-19n-3w, dry, TD 6,038 ft., Pawhuska 2,414 ft., Lower Pawhuska 2,683 ft., Oread 3,262 ft., Avant 3,924 ft., Layton 4,303 ft., Hogshooter 4,435 ft., Checkerboard 4,810 ft., Big lime-Oswego 4,970 ft., Mississippi lime 5,303 ft., Woodford 5,560 ft., Misener 5,615 ft., Sylvan 5,626 ft., Viola 5,665 ft., Wilcox 5,824 ft., 2nd Wilcox 6,003 ft.

Payne County: Jack White and Marathon 1 Mitchell, SE SE NW 3-20n-2e, dry, TD 4,150 ft., Bartlesville 4,084 ft. with slight odor and stain of oil.

Pontotoc County: Belgan Oil 1 Britt, SE SW SW 20-4n-7e, dry, TD 2,168 ft., Therman 870 ft., Boggy 990 ft., Gilcrease 1,580 ft., Wapanucka lime 1,940 ft., Cromwell 2,150 ft.

Deep Rock 1 Bond, NE NW NE 23-4n-4e, dry, TD 3,003 ft., Viola 1,442 ft., Bromide dense 1,630 ft., 1st sand 1,660 ft., 2nd sand 1,757 ft., McLish 1,918 ft., Joins 2,665 ft., Arbuckle 2,770-3,004 ft.

Equipment Men in the News

Company Offers Unusual Latin-American Service

Better service through better understanding is the motto of the Transamerican Factors, Ltd., a California organization

DR. SARMIENTO

VICTOR E. MILCH

with headquarters in Los Angeles, and branches in Colombia, Venezuela, Ecuador, and Peru, South America, catering to the petroleum industry in these countries, with a 100 per cent Latin-American staff, all trained and educated in the United States.

This specialized type of representation is rendered at present in these countries, for the following California manufacturers of petroleum equipment: Pacific Valve & Pump Co., Long Beach; Oil Base, Inc., and Superior Tank & Construction Co., Los Angeles; Joshua Hendy Iron Works, Sunny-Wilson Oil Tool Corp., Ltd., Ventura, and Page Oil Tools, Inc., Long Beach.

The functions and activities in each country are directed by graduate petroleum engineers, with practical experience in the production departments of major oil companies, in the United States and foreign fields.

Guiding heads of this organization are: Dr. Gonzalo Acosta Sarmiento, Dr. Hernando Madero Paris, and Victor E. Milch.

Purdy Appointed Manager At New Ryerson Plant

F. A. PURDY

Frederick A. Purdy has been appointed manager of the new Los Angeles plant of Joseph T. Ryerson & Son, Inc., warehouse steel distributors. Purdy joined Ryerson in 1931, serving first as an engineer at the Buffalo plant of the company; he later represented the firm in New York State, heading the Rochester district sales office for 4 years. Associated with Purdy is Theodore L. Kishbaugh who has been named assistant plant manager. Announced as in charge of the operating and service divisions is Thomas E. Williams, a 23-year Ryerson veteran. Vernon D. Rogers has been appointed office and credit manager.

Baash-Ross Appoints Frank Bergeron Export Manager

Baash-Ross Tool Co. has announced appointment of Frank E. Bergeron as manager of its export department headquartered in New York. Bergeron joined Baash-Ross 11 years ago and advanced to the position of sales manager from which position he has been moved to his new duties. Concurrent with the appointment of Bergeron, the company has enlarged its export offices which are now located at 11 West Forty-second Street, New York.

Hewitt Appoints Knight As Tulsa Distributors

Hewitt Rubber Co., Buffalo, has appointed Knight Manufacturing Co. as distributors of the company's mechanical rubber products in Tulsa. Principal items in the line are transmission and conveyor belting and all types of industrial hose. The new distributorship is headed by Frank Monahan and Dean Knight. The company has moved to a new location at 923 East Fourth Street.

Clarke Appointed Vice President Of Dayton Rubber

M. H. Clarke has been appointed vice president and director of manufacturing of Dayton Rubber Manufacturing Co. His duties will include responsibility for the engineering, production, laboratory, traffic, safety, and plant-protection divisions in all of the company's operations. Prior to joining Dayton Rubber, Clarke was president of Lake Shore Tire & Rubber Co., Des Moines.

Oil Center Tool Elects White Director

C. B. WHITE

Charles B. White, head of the investment banking firm of Charles B. White & Co. of Houston, has been elected to the board of directors of Oil Center Tool Co., Houston, according to an announcement made recently by Robert L. Tilly, president of Oil Center.

Finney Named Vice President

Dwight L. Finney has been appointed vice president and general manager of General Machine & Tool Co., Wichita. For the past 15 years Finney has been associated with National Supply Co. in Kansas. During this time he has held positions of Wichita city sales representative, field salesman, Kansas district tubular representative and at the time of his separation from National was assistant district manager.

Nason Promoted by Monsanto

Promotion of Howard K. Nason to associate director of the central research department of Monsanto Chemical Co. is announced here by Dr. Carroll A. Hochwalt, central research director for the company. Nason has been associated with Monsanto since 1936, and since 1944 has been director of development of the central research department in Dayton.

Hochwalt also announced appointment of Edward M. Hubbard, Milton Kosmin, and Ralph R. Wenner as group leaders at the central research department.

Myers Joins Market Department

Appointment of Robert C. Myers as assistant manager, market development division of U. S. Steel's Carnegie-Illinois Steel Corp. sales department, has been announced by Robert J. Ritchey, division manager.

Parkersburg Officials Leave on South American Trip

A. EVANS-LOMBE

A. G. Evans-Lombe, vice president in charge of sales, and J. A. Lyne, chief field engineer for The Parkersburg Rig & Reel Co., left Miami October 11 for an extended trip through the oil fields of Colombia and Venezuela. They will make the entire trip by air and plan to spend about a month covering all the principal oil fields in the two countries. Most of their time will be devoted to studying operating conditions and equipment needs of the South American fields. They expect to arrive back in the United States about November 15.

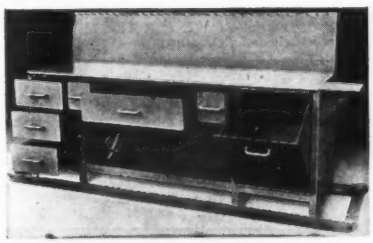
Hays Named Vice President Of Hinderliter Tool Co.

G. A. HAYS

George A. Hays has been appointed vice president and general manager of Hinderliter Tool Co., a division of H. K. Porter Co., Inc., at Tulsa, following the retirement of Frank J. Hinderliter who founded the company in 1920. Hays was formerly vice president of Oil Well Supply Co.

OWEN

TYPE "A" WORK BENCH



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There's space in this all-steel, all welded bench for all the hand tools on any drilling rig. Six big drawers and a rag bin, with a total of over 14 cubic feet of storage space, plus the tool pegs on the back apron, provide room for protecting all tools against loss or damage.

Buy one for each rig you own . . . and they'll pay for their cost in the savings they effect.

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All ads except Situations Wanted, 10 cents a word. Minimum charge, $2.00 per insertion.
Situations Wanted ads, 5 cents a word. Minimum charge, $1.00 per insertion.
Centered Line, any ad, 75 cents.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

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$9.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
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EQUIPMENT FOR SALE

FOR SALE: Diesel Engine powered rotary drilling rig, suitable for 5,000′ drilling. Priced cheap for quick sale. Phone 306. Box 1360, Seminole, Oklahoma.

FOR SALE: 5,000′ 4½″ OD 16.60# Range 2 drill pipe with regular tool joints; 6,100′ 4½″ OD 16.60# Range 2 drill pipe with A.P.I. F.H. tool joints. Also 1 steel drilling rig complete with boilers and drill pipe capable of drilling 6,000′. 7 Nixon Gas Lifts complete with weights, lifts and line. Wire, write or phone Louisiana Iron & Supply Co., Shreveport, La.

1 Cardwell Model R.L., Double Drum Spudder with 3 sheave 50′ A-Mast with Steel Dog House, 5″ tools, circle, jack, wrenches, etc., but less lines. Excellent condition. Priced $11,000 for quick sale. Wire or write Box B-426, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE
6—125 H.P., 250# W.P. Oil Field Boilers
Hartford Test A-1 Condition.
ENGLE PETROLEUM, INC.
P.O. Box 502
Salem, Illinois

EQUIPMENT FOR SALE

FOR SALE OR RENT: 8,000′ 4½″ A.P.I. Full Hole Drill Pipe. Melton Well Service, Seminole, Oklahoma.

BUBBLE TOWERS, Agitator, Jenkins Cracking Unit, Condenser Boxes, Flange Fittings and series 150 fittings, Omar Refining Co., Garber, Oklahoma.

FOR SALE: 1—D-7 Caterpillar equipped with Trackson pipe layer. Best of shape. Just completely overhauled by Roberts Tractor Co. of Dodge City, Kansas. Serial #9G6930. $6,500.00. 1—#12 Buckeye wheel type ditching machine, pipeline special; new Buda motor; entire machine in best of shape. Serial #4219. $4,500.00. W. M. Davidson, Box 1857, Pampa, Texas.

FOR SALE
20,000 ft. 2″ upset tubing 8 rd. thread.
20,000 ft. ⅝″ sucker rods, used less than 3 yrs. in wells without salt water.
10 pump jacks ranging from #6 to #22½ gear boxes.
5 100 bbl. bolted tanks.
2 210 bbl. welded tanks.
1 National Heater.
All of the above is good used equipment located in Illinois. Phone Salem 580 or write D. & H. Well Servicing Company, Box 176, Salem, Illinois.

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CLEANED TESTED PAINTED
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41 years' experience
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"ANYTHING containing IRON or STEEL"

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FOR SALE: Double drum Dietle casing puller with Fordson power. 50′ mast and tools. R. S. Hanson, 208 Petroleum Building, Wichita, Kansas. 2-4343.

FORT WORTH Model D Spudder with built-in shear poles and Climax Model R-41 120 H.P. gas-gasoline engine. Travco Equipment Co., 110 Midco Bldg., Tulsa, Okla. Phone 5-2251.

FOR SALE: New Allis-Chalmers pulling unit mounted on 1942 Ford, long wheel base. Truck has new 1946 motor and eaden rear axle complete with new lines, tools, sand pump and sand lines. Priced reasonable. Box 397, Mattoon, Illinois, Phone 2430, Mattoon, Illinois.

FOR SALE
100—84′ steel derricks — Muskogee Iron Works.
159,000# capacity. Complete with 2 beam —2 sheave crown blocks. Price $350 each, FOB cars, Arp, Texas.
LOUISIANA IRON & SUPPLY CO.
Longview, Texas
Phone LD21

1—RL single drum Cardwell Unit with HXE Hercules motor.
1—14x14 Ajax drilling engine.
1—199′ Emsco 537,000# derrick with substructure and sills.
4—125 HP 350# WP Donovan boilers.
JAMES W. LOMAX
506 Esperson Bldg. Houston 2, Texas

DIESEL GENERATOR SET

105 h.p. Murphy Diesel Generator set, Model ME-4, direct connected 50 KW General Electric generator 3 phase, 60 cycle, 230 volts, with direct connected exciter 1.5 KW, 125 volts, complete with batteries, switchboard, and one spare injector. Ready to run. Immediate shipment. Subject to prior sale.

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1020 N. Kolmar Ave. Chicago 51, Ill.
Phone: Capitol 1020, Ext. 32

NEW GASOLINE EQUIPMENT

TRI-ROTOR PUMPS, 40 gpm @ 2500 rpm, 1¼″ openings, variable flow hand control, #20-DV Yale	$35
NEOPRENE HOSE, 1½″ x 30 feet, M&F couplings	$17.50
LINE STRAINERS, 1½″, #187 OPW	$5.75
GASOLINE ENGINES, 1½ hp, B&S model NPR, 1.39 ball bearing speed reducer	$60
FLEXIBLE COUPLINGS, ¾″ x 2½″ OD, with disc	$3.50
LIGHT PLANTS, 1½ KW, 110/1/60, Kohler	$350
STEEL TANKS, 500 bbl., 21′6″ x 8′ high, bolted type	$750

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FWD 1946 MODEL SU STANDARD
Chassis and Cab
1100 X 20 Tires — Dual Rear
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One—3250 gallon lead blending plant, complete with 30 ton scales weightograph; Goulds 5x4 centrifugal pump with 20 HP G. E. motor. All housed in 30x20 steel insulated building with 10′x10′ brick wash room. Located Lewiston, Mont.
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